The Iron Age

A Review of the Hardware and Metal Trades.

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The Architectural Utility of Iron.

History of Iron Construction—Prominent Buildings here and Elsewhere.

II.

The excavations at Pompeii show even at the time of the destruction of that city that much had been accomplished in the manipulation of iron. As we approach nearer to our own times we discover many evidences of proficiency in the manufacture of ornamental iron. In the ecclesiastical architecture of the middle ages, this metal enters as an important element in the construction of altar railings, gateways, fountains, etc., and the mechanical skill exhibited in these works of art, is of a very high order.

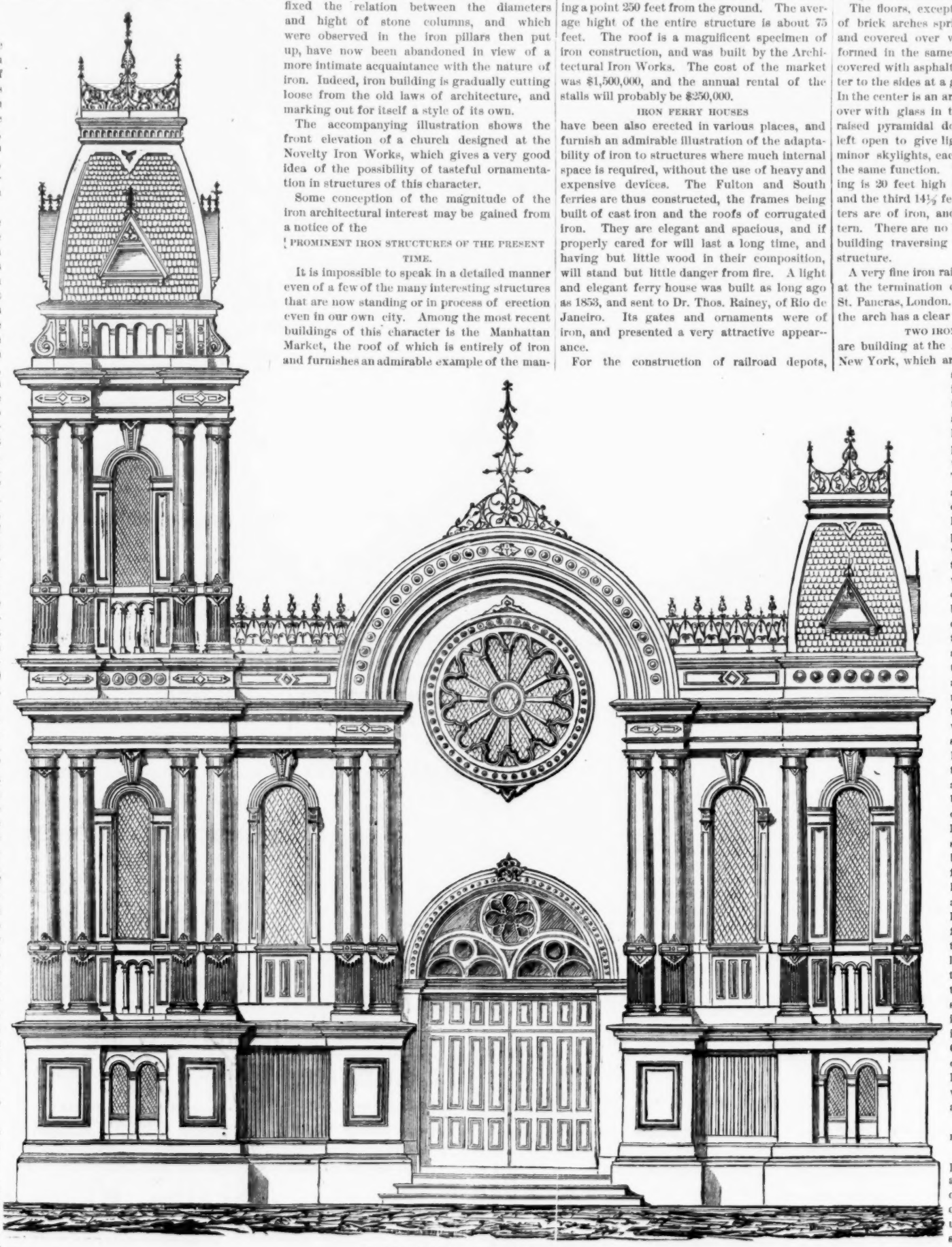
The employment of iron in the manufacture of beams and columns is apparently of more recent origin. We know that they have been used in England from the beginning of this century, as in 1801 a so-called fire-proof cotton mill was erected at Manchester for Philips & Lee. Cast iron beams were employed in this instance, and the building was designed by the celebrated firm of Boulton & Watt. Although no reliable data existed from which to form an accurate idea of the strength of these beams, yet the genius of Watt enabled him to obtain "a tolerably correct approximation to the true proportion of the parts of the beam so as to secure a maximum strength with a given quantity of material." The structure was 140 feet long, 42 feet wide, and seven stories high. Each floor contained 648 square yards of surface. The beam used in this case was of the T section, and this was the form adopted by engineers until 1827, when Hodgkinson made his experiments to determine the proper form of beam. The common I girder was then adopted, and the considerations and formulae which determine the strength of beams were arrived at. Wrought iron beams were not used until later.

Iron bridges were constructed long before iron houses, the Coalbrookdale bridge referred to in our last issue having been built in 1773. Iron ships were also constructed in 1835. The application of the metal to buildings on a small scale soon followed, and by 1840 both columns and beams of iron were used in a few fire-proof factories and other large edifices. The first iron fronts erected did not reach over one story, and many such fronts are now standing. Gaining courage from these experiments, architects projected the erection of fronts composed entirely of iron. In 1842, a building containing a large proportion of iron was erected in Boston, and so strong was the prejudice against such structures, that the builder was compelled to guarantee that if the attempt did not prove a success, he would remove the building at his own expense. A structure of which the front and rear were of iron was shortly afterward erected in New York, by Mr. James Bogardus, who was so well satisfied with the success of his attempt that he entered definitely into the business of erecting iron buildings. The experiments made in 1845-6 on the construction of tubular bridges and beams preparatory to the erection of the Britannia bridge over Menai Strait, marks the next era in iron construction. The knowledge of the architectural capacities of wrought iron then obtained was very extensive, and gave to iron building a vigorous impetus. In the Crystal Palace, erected in Hyde Park, in 1853, three thousand iron girders were employed.

THE APPLICATION OF IRON TO THE EXTERNAL PORTION OF BUILDINGS

is essentially due to American enterprise. In common, however, with all new projects, the progress of its introduction has been slow. Many objections were raised in its incipiency, and kept it from advancing into popularity. Iron fronts, constructed in sections, were looked upon with suspicion and regarded as insecure, while it was entirely out of the question to construct a front of one casting. Others claimed that, in case of fire, structures of cast iron would be liable to burst on account of the well known difficulties in the founding of this metal. Sentimentalists also placed themselves in the way, by urging the great impropriety of imitating in one kind of material the forms used in another. The mistakes of architects, that we have before alluded to, in carrying the ornamentation of iron buildings to excess, also impeded the progress of iron construction. Buildings were erected 20 years ago, in which the same amount of ornament was displayed at the top as at the bottom, and the columns and cornices and lintels were crowded with twistings, contortions and complexities of adornment, simply because it was cheap to do so. Such builders drew upon themselves a just condemnation, which, unhappily, fell upon the system of iron building in general.

The discovery of gold in California is said to have exerted a decided influence on iron construction. It was found that American cast iron buildings shipped to the mines could be put up with great facility, while the wrought iron buildings from England required many weeks for their erection. To the impatient for tune seeker this was a great advantage, and the matter of time decided them in the construction of cast iron buildings. It was during the late rebellion, however, that iron architecture received that impulse which has given it its present status in America. The enormous increase in the wages of stone cutters and quarrymen, and the consequent rise in the cost of stone buildings, turned the attention of architects generally to iron. The advantage of cheapness now being greatly in favor of this material, the business experienced a rapid development. Under the influence of increased patronage, iron builders have been able to perfect their plans and simplify the operations of founding, forging, and construction, and thus maintain the advantage they had gained. The architect of an iron architectural establishment of to-day must be also an engineer. He must know how to estimate the expansive and contractive tendencies of the metal, he must calculate the resisting power of the column or girder he uses, and dispose his building in such a manner as to gain the greatest advantage from the least amount of material. The difference in the appearance of the iron structures of the present time and those erected ten years ago is very striking. The outlines are, as a general thing, bolder, and the old rules which fixed the relation between the diameters and hight of stone columns, and which were observed in the iron pillars then put up, have now been abandoned in view of a more intimate acquaintance with the nature of iron. Indeed, iron building is gradually cutting loose from the old laws of architecture, and marking out for itself a style of its own.



FRONT ELEVATION OF IRON CHURCH.

The accompanying illustration shows the front elevation of a church designed at the Novelty Iron Works, which gives a very good idea of the possibility of tasteful ornamentation in structures of this character.

Some conception of the magnitude of the iron architectural interest may be gained from a notice of the

PROMINENT IRON STRUCTURES OF THE PRESENT TIME.

It is impossible to speak in a detailed manner even of a few of the many interesting structures that are now standing or in process of erection even in our own city. Among the most recent buildings of this character is the Manhattan Market, the roof of which is entirely of iron and furnishes an admirable example of the manner in which large spaces are spanned by this materia., and the light appearance which such immense structures present. The building faces four city thoroughfares, viz: Eleventh and Twelfth avenues, and Thirty-fourth and Thirty-fifth streets. The main building is 800 feet long by 200 feet in width, with a bulkhead on the river front 200 by 100 feet. The structure covers 74 city lots. A plaza for farmers' wagons has also been constructed, covering 14 city lots. The external walls of the building are of brick, and the pillars and arches of iron. The main central arch is 93 feet high, resting on 146 columns, and having a span of 100 feet. The trusses on which this arched roof rests, are elaborately constructed, and the feet of each are connected by a horizontal tie which counteracts a portion of the thrust. Each arch is connected with its horizontal tie by means of two vertical ties. The diameter of each pillar is 16 inches. The roof contains six skylights, which afford an ample supply of light. The exterior brick walls are each 50 feet distant from the rows of columns on either side, and connect with the central arch by a roof slanting up to the feet of the trusses. At the center of the building is a dome and spire constructed of iron, and reaching a point 250 feet from the ground. The average hight of the entire structure is about 75 feet. The roof is a magnificent specimen of iron construction, and was built by the Architectural Iron Works. The cost of the market was $1,500,000, and the annual rental of the stalls will probably be $250,000.

IRON FERRY HOUSES

have been also erected in various places, and furnish an admirable illustration of the adaptability of iron to structures where much internal space is required, without the use of heavy and expensive devices. The Fulton and South ferries are thus constructed, the frames being built of cast iron and the roofs of corrugated iron. They are elegant and spacious, and if properly cared for will last a long time, and having but little wood in their composition, will stand but little danger from fire. A light and elegant ferry house was built as long ago as 1853, and sent to Dr. Thos. Rainey, of Rio de Janeiro. Its gates and ornaments were of iron, and presented a very attractive appearance.

For the construction of railroad depots, iron is valuable for the same reasons as have already been referred to, viz., the facility with which a large amount of space can be obtained and the structure built of a durable character. The Grand Central Depot of New York illustrates this class of buildings very well. The most admirable example of iron construction, however, as applied to this department of architecture, is to be found in the Hudson River Railroad Freight Depot, in St. John's Park. The building covers an area of 405 by 439 feet, or in all 178,327 square feet. The foundations of this structure are heavy blocks of stone resting in a bed of concrete. On this sub-stratum stand granite piers at intervals of 12½ feet. These support iron columns, of which there are 1290, in three tiers of 430 each. The columns of the second and third floors rest exactly upon those of the first, forming in reality 430 columns, each 50 feet high. The total length of the iron columns is, therefore, over 20,000 feet, and their aggregate weight is over 3,000,000 pounds. The total length of the iron beams and girders in the building is over 220,000 feet, or more than 40 miles. Their total weight is over 30,000,000 pounds, which makes the entire weight of columns and beams about 16,500 tons.

The floors, except the cellar, are composed of brick arches springing from the iron beams and covered over with cement. The roof is formed in the same manner, except that it is covered with asphalt; it inclines from the center to the sides at a grade of ⅛ inch to a foot. In the center is an area 100 feet square covered over with glass in the form of a moderately raised pyramidal dome. The space below is left open to give light to the building; eight minor skylights, each 25 feet square, perform the same function. The first story of the building is 20 feet high in the clear, the second 18 and the third 14½ feet. All the doors and shutters are of iron, and made on the rolling pattern. There are no less than 14 elevators in the building traversing the entire hight of the structure.

A very fine iron railway station was also built at the termination of the Midland Railway, at St. Pancras, London. Its length is 690 feet, and the arch has a clear span of 240 feet.

TWO IRON LIGHT HOUSES

are building at the Architectural Iron Works, New York, which are very interesting in themselves, as well as illustrating the application of iron to another department of architecture. Each light-house rests on eight iron piles 20 feet long, and weighing 80,000 pounds. The piles slant inwardly, and screw into immense cast iron shoes fixed to the lower surface of the first platform of the structure, which is 40 feet in diameter, and 15 feet above high water. The light-house is of conical form, and braced by eight immense slanting columns, which screw into the shoes before mentioned, and bear upon the tops of the piles. The columns are firmly braced with tie rods and struts. The lantern is 150 feet above the water, and is reached by a spiral staircase containing 127 steps. The latter is contained in a sheet iron drum, and on the second floor, between this drum and the outside iron wall of the light-house, are four rooms, separated from each other by iron partitions radiating from the center. Each room has, therefore, two straight and two curved sides, and here the keeper and his family are to live. From the lantern deck of this light-house, as it stands in the yard of the works at the foot of East Fourteenth street, a magnificent view is to be had of the two cities, the river and the Bay. On the first platform isan elaborate arrangement for lowering a life boat. The whole arrangement within and without is of iron.

As regards buildings of a more ordinary character,

THE DREXEL BUILDING

perhaps illustrates as well as any the nature of some of the immense structures of iron that have been put up for commercial purposes. It is located on the corner of Broad and Wall streets, New York, extending 103 feet on the former and 107 feet on the latter, with a short side at the junction in lieu of a corner. It includes a deep cellar, a basement and seven stories above, giving a total hight from the sidewalk of about 112 feet. The estimated cost of the building is about $500,000, but the ground and houses thereon which were torn down cost $995,000. The depth of the foundation walls on the highest grade of Wall street is 18 feet. The foundation rests on earth, with a base of concrete on which the masonry is laid. The foundation walls are 3 feet thick, the exterior walls of the building 2½ feet thick at the bottom and 2 feet at the top. The latter are of brick laid in cement, lime and sharp grit sand mortar, fronted with white Vermont marble. The floor beams are of rolled iron 10½ by 9 inches, with an average distance between the centers of 3½ feet. These intervals are spanned with brick arches. The iron columns supporting the floors are 15 inches in diameter. All the floors are laid with marble. The roof is a mansard built of iron and overlaid with slate.

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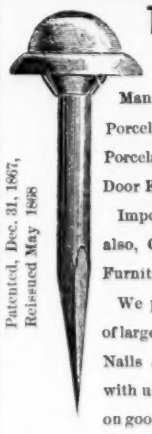

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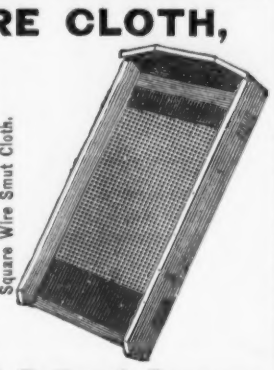

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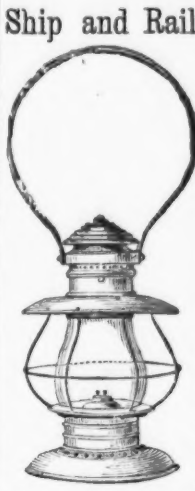

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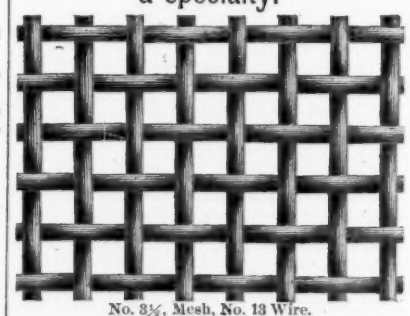

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STEEL ORES.

Extraordinary value given to the Best Ores by the Bessemer and Siemens-Martin Processes. Only Three Large Groups of Deposits in the Settled States. The South the Best Field for Investment.

The all absorbing question among the iron men at the present time, is how to obtain an adequate supply of ore suitable for the manufacture of steel and the best grades of iron.

The revolution wrought by the invention of the Bessemer process and the Siemens furnace is more radical and complete than any which has preceded in the whole history of the iron industry.

The Bessemer process has an immense mechanical advantage to recommend it over the old process of purifying iron, beside making a vastly superior product.

Instead of purifying the pig metal by the slow, laborious and costly process of puddling by manual labor in masses of a few hundred pounds at a time, a single converter, managed by men receiving only one-third the wages of puddlers, can purify five to ten tons of molten pig within the space of thirty minutes, and when the process is complete, you have, in place of little muck bars that must be piled and welded, large ingots of homogeneous cast steel, which, while they have cost little more than the same amount of wrought iron, have an intrinsic value ten-fold greater. It is plain why England, who has introduced the Bessemer process more extensively than ourselves, should be searching the whole world for ores adapted to this use, and should pay more for Bessemer pig than she used to charge for iron bars. Bessemer ores have sprung into an extraordinary intrinsic value, very much greater than that of others which a few years since were supposed to be equally valuable. We have such exhaustless supplies of iron ore so widely diffused through this country, that we have been slow to admit that a scarcity of any kind was even possible. But we find only three great groups of Bessemer ores in the settled States, viz.: the Lake Superior, Missouri and North Carolina regions, the latter extending into the adjacent States. And when we come to explore these regions more carefully, we discover that while some single deposits, as that of Iron Mountain, are vast in extent, their number is comparatively limited, and that a large proportion of the ores, even in these favored localities, fall below the desired standard. The Siemens furnace, by using gas in place of bringing the coal into direct contact with the iron, enables the manufacturer to use the poorer and cheaper coals in the manufacture of steel, and thus adds still greater intrinsic value to the purest ores. Thus these two great inventions, while making the quality of coal less important, have raised the pure ores into the greatest importance, and made them masters of the whole situation. It is a curious fact that the iron masters of this, the great iron State, have been slower than the English, or even our Western manufacturers, to apprehend this great revolution. As their fathers made iron, they are content to do the same, and when they venture out from Pennsylvania to invest in ore lands, they seek a property made after the fashion of a country apple pie, with limestone and coal for upper and under crust, and an abundant filling of iron between. The fossiliferous hematite deposits of Alabama are well taken up, and are held at twenty times the price it would take to purchase some of the finest Bessemer deposits in the whole country. The great Bessemer works of the East, which have been built at a cost of several millions of dollars before any adequate provision was made for ores, have been compelled to order some 40,000 tons of pure ores from Algeria, so that we have, at the present time, the double phenomenon of coals being carried to Newcastle and iron ore being imported into Pennsylvania. Having lost many chances to secure suitable ores at low prices in the Lake Superior region, they are now commencing in good earnest to analyze and investigate the equally valuable deposits in the South. The past few years have shown conclusively that the best ores will supplant the poorer, even for iron making. It does not seem very long since the iron masters of Pittsburgh pronounced the ores of Lake Superior worthless. Now that city is one of the chief consumers of these ores, having immense furnaces running upon them alone, and they may be found even in the iron works of Richmond, Va., and Knoxville, Tenn., The shipments of Lake Superior ores have grown from only 7000 tons in 1856 to nearly 900,000 tons the present year.

The causes which have hindered the development of the South for so many years, such as slavery, war, and the terrorism of Ku-Klux Klans, are no longer operative, and the steel ores of this region afford the most inviting field of investment ever presented in the United States. We have all read from childhood, with no little wonder, of the famous wootz steel which the natives of India have been wont to make from their ores, first reducing them in rude forges, and then roasting a pound or two of the bar iron along with dry wood in a sealed clay crucible; but there is an extensive deposit of ore in Yadkin county, North Carolina, where for years workmen have been accustomed to make steel direct from the ore in rude forges, with no cementing process, and it has been sold to the farmers around to make the cutting edge of knives, axes, plows, etc. There are, also, numerous other deposits from which tool steel can be readily made in ordinary forges. Blooms made from titaniferous ores at the Tuscarora Forge, in North Carolina, are shipped nearly in the form and condition in which they are taken from the forge, to Trenton, N. J., where they are converted into steel by the Siemens-Martin process. It would seem as though it would not long be necessary to send to Africa for Bessemer ores at a cost of $13 and upward per ton, when millions of tons of similar ores can be bought in the South for less than the timber is worth that covers them, and delivered in Philadelphia at little more than half this price. The extreme high prices of steel ores from Lake Superior and Missouri show that the value of these Southern deposits will soon be realized by capitalists. Iron Mountain ores sell readily for $10 at St. Louis, and Lake Superior ores command $14 at Cleveland for 1873 delivery, which makes them cost $17 and even $20 in Pennsylvania. We recently met a scientific gentleman from St. Louis, whose profession has made him thoroughly conversant with the value of ores, and having described a certain Southern property of upward of 23,000 acres of heavily timbered lands, containing extensive deposits of Bessemer ore, which could be bought for $50,000, inquired what such a property would be worth in Missouri. "A million dollars at a jump, sir," was the immediate reply. The Iron Mountain is easily worth many millions of dollars, and the same is true of several other similar ore properties in this country. A gentleman who purchased an interest in a lease of Bessemer ore lands in the West a few months ago for $5000, has since refused an offer of $150,000 for the same.

Professor Pumpelly, the State geologist of Missouri, fell in some time since with a party of gentlemen owning iron mines in the Lake Superior district, who were on their way with some English capitalists to examine their ore lands. They desired him to accompany them, which he resolutely declined, and on their insisting he should comply, he named a price for his services which he supposed would leave him free to return home, but they took him along, and at the expiration of twelve days paid him as many thousand dollars, and on the strength of his valuable testimony effected a loan of $3,000,000.

It is plain that neither the Michigan nor Missouri regions can supply the increasing demand of the Central and Southern States. Notwithstanding the exhaustless extent of the deposits at Lake Superior, together with the ease with which they can be mined, the enormous demand and unprecedented prices, it is a striking fact that the shipments of ore from that region show no material gain for the past three years. Where the ore must be carried to such a distance, for lack of fuel to smelt it near the mines, the great expense of docks, ships, railroads, etc., makes it impracticable even to meet the legitimate demand. The failure of the navigation of the Ohio River also presents an obstacle to the shipment of an adequate supply eastward from Missouri, so that we are now compelled to utilize the deposits in the Southern states, *nolentes volentes*.

Neither of these Western regions is as favorably located, all things considered, as the Southern field. Northern Michigan is a rugged, sterile region, compelled to look abroad for nearly all the farm products consumed by the large population its mines support, and it is further impeded by a long and severe winter. The South has a great advantage in both soil and climate, and still more in having extensive coal fields, both on the eastern and western limits of these deposits, affording the best possible facilities for the erection of steel works and the consumption of the ores near at hand, while its climate is more favorable than that of St. Louis for the carrying on of rolling mills in the summer months.

Here is the field for our young and enterprising iron men who would make the most of their future, for henceforth Bessemer rails will be cheaper at $100 than iron rails for nothing. There is also a good chance here for a few sagacious men to step out from the overcrowded ranks of mercantile pursuits and make more money with less trouble. There is no form of investment in this country so inviting to English capitalists as this, since the intrinsic value of ore lands can be readily ascertained, and it is a property requiring neither expensive buildings nor insurance, which cannot be destroyed by fire or flood, which grows more valuable with age; in short, a good Bessemer mine is better than a gold mine. F. B. N.

PHILADELPHIA, Jan. 2, 1873.

New Patents.

We take from the records of the patent office at Washington the following specifications of certain patents lately issued, which will be found interesting:

IMPROVEMENT IN REVERBERATORY FURNACES.

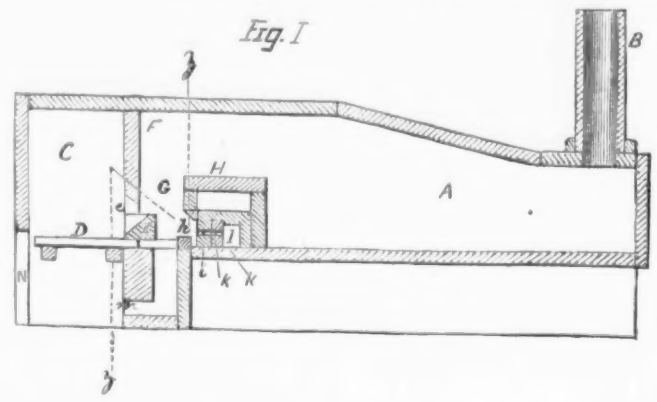
Specification forming part of Letters Patent No. 133,688, dated December 3, 1872, issued to James Westerman, of Sharon, Pennsylvania.

This invention relates to improvements in furnaces for puddling, boiling, or heating iron or steel, &c.; and consists in the construction and arrangement of devices whereby the carbon or smoke is readily and completely consumed, while at the same time the metal is more readily decarbonized, purified, and refined, all as hereinafter more fully set forth.

Fig. 1 is a longitudinal section, and Fig. 2 is a vertical cross-section on the line *z z* Fig. 1.

A represents the furnace in which the metal is puddled or heated; B, the smoke-stack leading from furnace A. C is the fuel-chamber. D is the grate. E is the grate-wall, built with an angular or beveled face, so as to prevent the fuel from entering or falling into the combustion-chamber. F is a wall built between the fuel-chamber and the combustion-chamber, an arched passage, *e*, being formed between it and the grate-wall E of sufficient capacity to allow the smoke and flames to pass into the combustion-chamber G. This arched passage or opening may be increased or lessened as found desirable or convenient. H is the bridgewall of the furnace, against which the products of combustion strike in passing from the fuel-chamber. On the face of this wall an offset or cavity, *h*, is formed for the purpose of breaking up or diffusing the current of smoke coming from the burning fuel. While the current is thus diffused a supply of oxygen is introduced and thoroughly combined with the smoke and other inflammable gases, enabling them to ignite more readily and pass upward and over the bridge into the body of the furnace in shape of flame, thereby insuring complete combustion of the carbon of the fuel and at the same time affording sufficient oxygen for decarbonizing, refining, and purifying the metal in the furnace. This is accomplished by means of a valve-chamber arranged within the bridge H, having a flue or opening, I, communicating with the outer air. K is a valve having a series of holes, *k*, pierced through it, which corresponds with a series of holes, *i*, pierced through the wall of the valve-chamber and leading into the recess *h* of the combustion-chamber. This valve K is so arranged within the valve chamber that it may be moved back and forth by means of a lever, L, pivoted to the outer wall of the furnace, as

Fig. I

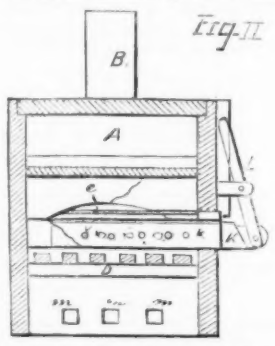


IMPROVED REVERBERATORY FURNACE.

shown by Fig. 2. *m*, *m*, *m*, are flues leading to the combustion-chamber for the purpose of cleaning it out when necessary. N is a movable door or gate for the purpose of removing the ashes and cleaning the grate-bars when necessary.

The operation of the furnace is as follows: The furnace is charged with the metal to be operated on through any suitable opening. Fire is kindled on the grate D and supplied with fuel through a suitable opening. The smoke and other products of combustion, after filling the chamber C, will pass in a current through the opening *e*, and, striking against the wall of bridge H, become diffused in the cavity *h*. At this point, through the openings *i k* and I, air is admitted. The oxygen, combining with the carbon gases, incites combustion, resulting in a flame, which completely consumes the smoke and increases the heat within the furnace, at the same time introducing a sufficiency of oxygen for the purpose of purifying and decarbonizing the metal under treatment in the furnace. When the fuel in the fuel-chamber has become hot enough to burn without generating smoke, the valve K may be adjusted, by means of the lever L, so as to decrease the volume of air admitted to the combustion-chamber, or shut it off altogether, if desired; and when fresh fuel is added to the furnace the valve can again be adjusted to admit the air necessary to insure complete combustion.

Fig. II



Claim—1. A furnace having the walls E and F, constructed, substantially as described, with passage *e*, operating in combination with a bridge-wall having a cavity or recess, *h*, and air-passages *i*, for the purpose specified.

2. The adjustable valve K, constructed, substantially as described, with air-passages *k*, operating in combination with the openings *i* and I.

3. The combination of the chambers C and G with walls E, F, and H, and valve K, constructed and operating as specified.

Iron and Steel in Railway Cars.

The opportunities for the use of iron and steel in railway cars are many and widely various. There are in this country and Canada 87 firms engaged in the manufacture of railway cars. In addition to this, almost every road in the United States builds a greater or less number of cars at its own shops every year, which is shown by the fact that there are upward of 270 men holding the position of master car builders upon the railroads of the country. The number of cars turned out of the various shops varies from one freight car per week to one hundred per month, and some running far above even the latter figure. New shops are constantly being opened, railroads are multiplying their facilities for building, and yet there are not cars enough to supply the traffic. To turn out a sound and durable freight car involves the use of thoroughly seasoned lumber, and those shops which build of dry stuff have to carry heavy stocks. Their lumber yards may be counted by the acre. Men with small capital cannot carry a stock sufficiently large, and are forced to build of green timber, and, of course, turn out a decidedly inferior article so far as durability is concerned. But roads must have the cars, whether they will last ten years or thirty. The demand is imperative, for freight may be waiting at every station upon the line. It would perhaps be the very smallest possible estimate to say that there are 24,000 freight cars built in the country every year, these figures including only box and flat, or gondola, freight cars, and have no reference to any others.

There are many advantages which wooden cars have in use, a part of which are inherent in the material and a part of which arise merely from the advanced state of wood-working tools and machinery. Owing to the cheapness of wood-working machines and the ease with which they may be constructed in the shop, wooden cars are cheap to build. The material itself is easily handled, men skilled in its use are readily obtained, and the first cost is small. Repairs are easy for the same reasons, but owing to the frailty of the material they are exceedingly numerous; sometimes whole shops are engaged on no other work. All these reasons combined show the wisdom of the railway companies in so generally preferring to build their own cars when practicable; and inasmuch as they do this, railway cars are very much better than could be expected from the poor material of which they are built. To decide definitely in regard to a material for car building, it is necessary to know somewhat of the usage to which a car is exposed. The work of a freight car is of the roughest description. The load is from 10 to 20 tons, the former figure, on some roads, being nominally the maximum. With this load it is put into a train of from 20 to 40 others, and pulled along at all sorts of speed by a 30 or 40 ton engine. The shocks are fearful, and it is a wonder that wood and iron can hold together under such blows. These, especially in the freight yards, are unavoidable in the rapid handling of cars. Rolling over embankments, getting off the track, and the thousand other nameless mishaps to which cars are constantly exposed, must be included in our calculation for strength. Wood, by its very weakness, is admirably adapted to meet some of these. A corner or a plank is smashed, and a block or a short piece of stuff makes the part as good as ever, while greater local strength might have entailed injury to the whole structure. Lightness must also be had in connection with the strength. A car upon eight wheels, 28 feet long, 7 feet wide and 6 high, must be sufficiently strong to carry a load of about 20,000 pounds, and when thus loaded, to sustain all sorts of unreasonable blows. It must last under this treatment as long as possible.

In actual practice there is little to guide one in the formation of an opinion relative to the comparative merits of iron or steel cars. The Central Railroad of New York has had a lot of iron cars running for some years, and so has the Hackensack & New York, now operated by the Erie road. On these two roads the conclusions naturally reached are entirely opposed to each other. On the Central too great weight, a poor construction, and probably a want of the best means of repairs, have told heavily against iron cars. Rust, too, has played sad havoc with the plating, and it must be confessed that the cars designed by Dr. B. J. Lamoth for the New York & Hackensack have suffered from the same cause so as to be now only available as open cars. On the other hand, these cars in the frame or body are as sound to-day as they ever were, and Mr. Robert Rennie, who had the cars built for the latter road, says that he should have no hesitation in putting just such cars upon the road now, only modifying them in the form and style of plates.

As materials, iron and steel have great advantages in the fact of their great strength. Were Bessemer steel a trifle more uniform, strength and extreme lightness might easily be obtained. According to E. J. Reed, in his work on iron ships, its variation in strength is so great that when proper allowance is made for it, the weight of the structure will nearly, if not quite, equal that of iron. This is probably only an accident of the present state of the art; time will probably develop means for obviating the difficulty. The ease with which thin plates are eaten through points toward the use of iron or steel for a frame, the covering of wood or some non-corrosive substance in which it is not necessary to have great strength. Iron affords a far greater strength to resist compression than wood. Hence the sills being of iron would be lighter and at the same time better able to resist the "shutting up of a train," as it is sometimes called, and being lighter there would be less momentum, and in a train of iron cars these shocks would be materially diminished. In a report made by Mr. M. N. Forney, of the *Railroad Gazette*, to Mr. Geo. H. Ellery, upon the Lamoth iron car, it was stated that the total number of pounds hauled per 1000 pounds of freight was 1718 in the iron car while in the ordinary wooden cars the load per 1000 pounds of freight was from 9½ to 19 per cent. more. That is, in the best wood car the total load was 1884 pounds, in the poorest 3054 pounds; while in the iron car it was only 1718 per 1000 pounds of paying load. When this amount is multiplied by the annual mileage of the car, and it is remembered that it costs as much to haul this load as to haul freight, some slight conception may be gained of the enormous saving which becomes possible. In designing, it was found that the iron car could have about 200 cubic feet more capacity than the wooden cars. These are advantages which are of the very highest importance, but they are not all. Though the cars upon the N. Y. Central are by no means perfect nor satisfactory, yet a careful inspection showed that the iron I beams which formed the sills of the flooring were taking the whole burden of the car and its load, and they seemed well able to support it. Probably the whole system of truss rods and transoms could have been taken away with advantage. This would have reduced the weight and have brought it down to that of the wooden cars which are from one to two thousand pounds lighter than the iron cars upon the same road. Careful inquiry at the repair shops brought out the fact that when these cars got out of shape by an accident they were like a tin box, difficult to restore.

Careful consideration of all these points leads to the conclusion that the balance of advantages is in favor of iron as a material for freight cars. The durability of the framing is unquestioned, Mr. Rennie's experience on the Hackensack road proving that beyond a doubt. In strength the iron far exceeds that of wood, while steel, uniform in texture, will exceed either. Fire-proofing has not been mentioned, for a combustible freight will burn whether in iron, wood or any other substance, provided it gets started. The speedy and economical introduction of iron or steel for railway freight cars depends perhaps more upon cheap and efficient machines for working iron than upon any other one thing. The immense start which wood has in this respect is probably the only obstacle in the way of using metal almost exclusively for this immense product, cost standing slightly in the way, as was shown by the fact that an iron passenger car built for the Hackensack road in 1859 or '60 at the same time as the iron freight cars mentioned, cost only $5000. This was built without special tools, and only one car was ordered, yet the price was only a slight advance upon that asked for wooden coaches of the same style and capacity, yet the builder lost nothing by it. Cars must not only be built as cheaply but as quickly of iron as of wood. This is imperative under the present enormously increasing demand for transportation.

With the introduction of the machines must come designs for iron cars. One is not enough for that car which answers perfectly for the traffic of one road may utterly fail upon another. The simple failure, then, of an iron or steel car should not be looked upon as a sufficient condemnation. The traffic, the road, the style of usage and the general requirements of the road must all be taken into account. The plan of steel rods and cast iron pipes fastened together by peculiar cast or malleable iron attachments, the lower frame also of iron pipes, as proposed by Dr. Lamoth, is probably one capable of very extensive adoption. It would, however, undoubtedly require modifications where from situation iron pipes become more costly than iron in some other form. These matters readily adjust themselves. The consumption of timber will soon compel a more careful investigation of the subject by railway corporations, and a thorough trial of iron or steel cars may be anticipated in the immediate future.

The Minerals of Wisconsin.

The Oshkosh *Northwestern* says: To those who have always regarded the modern portion of Wisconsin as a sterile, sandy region, it may be a surprising fact that no part of the United States is richer in mineral wealth than this section of our State. While at Stevens Point, a short time since, we had an opportunity of examining some of the products of this region Near Grand Rapids large beds of kaolin porcelain clay have been discovered, and samples of it have been sent to England and France for analysis. It is found to be pure and white as snow, exactly suitable for porcelain ware and many other useful purposes. When burned it is free from all impurities, and is easily manufactured. Immense beds of deep red clay of the best kind for the manufacture of brick exist on the line of the Central Wisconsin Railroad. Samples shown us by Mayor Eaton, of Stevens Point, excel in color and texture the best eastern brick. Through Waupaca and Portage counties are immense beds of tripoli, which can be dug up, and in its natural state is used for polishing metals and furniture. Capital and enterprise would turn these tripoli beds into mines of untold wealth. Beyond Stevens Point, on the line of the new railroad, a brown substance was discovered, which, on being mixed with a little oil, proved to be similar to umber, and with no change made excellent paint. Large beds of this material exist among the mineral resources of the north. The very sand which discouraged the traveler as he wearily made his way through this region of the country, has been examined by scientists and pronounced the best for the manufacture of glass. The beautiful corn-colored clay made into the "Weyauwaga pottery," also exists in large quantities, and can easily be transmuted into a merchantable commodity. A few miles beyond the present terminus of the Wisconsin Central Railroad, is the Penokee iron range, rich in iron and other valuable minerals. Beds of clay suitable for the manufacture of fire-brick of the best quality have been unearthed at several points along the line of the new railroad. Near the northern terminus of the road, copper, iron, bismuth and silver mines have long been worked, and it is safe to say that the completion of this road to the lake will develop far more of the mineral wealth of that region than has yet been known. This whole region of country, from the Fox River northward, while it lacks the fertile richness of the southern portion of the State, seems to be underlaid with mineral wealth, which some day must make it a productive region. To develop this wealth by the building of railroads, and by calling the attention of capitalists in this direction, demands the attention of the press of the State and the fostering care of the government.

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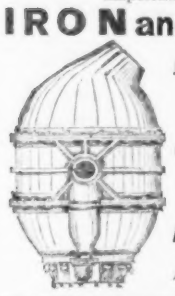
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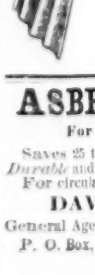
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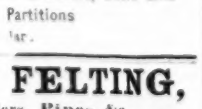
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National Amalgamated Iron Worker's Association.

One of the largest and most powerful of the trades' unions of the British kingdom held its annual business meeting at Birmingham during the first week in December. The proceedings were opened on Tuesday at the Racquet Court Hotel, Bath street. About 150 delegates were present, representing every grade of workers in iron in all the centers of the industry in England, Scotland, and Wales. Middlesbro', Manchester, Leeds, Bradford, Gateshead, Sheffield, Merthyr Tydvil, Doulais, Swansea, Glasgow, Motherwell, Barrow-in-Furness, and the South Staffordshire districts, were all fully represented, and the affairs of the workmen in all these centers were discussed.

It is now 11 years since the association was formed at Gateshead-on-Tyne. One of its earliest promoters, and for the last eight years one of the most zealous leaders of the movement, has been Mr. John Kane, who now occupies the post of secretary, and who holds a responsible position in the interests of the men of the North of England Board of Arbitration of the Iron Trade. Four years ago the membership was almost entirely confined to the North of England district, and the membership was only 176. Last year, when the annual conference was held at Burslem, the membership had increased to 3000, and the South Wales and Manchester districts had joined. So remarkable has been the increase of the association during the past year that adhesions have come in at the rate of 1000 per month; the organization has a lodge now wherever iron is raised, smelted, puddled, or rolled, and the membership reaches a total of from 16,000 to 17,000, distributed in 34 lodges.

Mr. Shufflebottom, delegate for Harrington, was chosen to preside. He delivered a short address, in the course of which he dwelt on the importance to operatives in the iron trade of using the organization they possessed so as to protect their interests and advance their prosperity.

Mr. Kane read the general secretary's report. After congratulating the members on the unparalleled increase in their numbers, the secretary said that many difficulties had, during the year, been cleared away and removed from the path of the union. Many discouraging circumstances had arisen through ill-timed and hasty action, and by the acts of a class of people who, in open defiance of the laws of the Board of Arbitration, and in direct opposition to the rules of their own association, adopted the old and mischievous policy of throwing down their tools and suspending work if the slightest hitch occurred between them and their employers. Such a state of things was much deplored by all true friends of arbitration, and aroused a feeling on the part of the employers against the association. For the first time in the history of the iron trade a basis had been laid down by the board of arbitration, by which wages rose and fell in accordance with the selling price of iron in the market; and it must not be forgotten that the men had got more frequent and better advances than they had ever got by strikes.

The report was adopted.

The auditor's report showed the gross receipts to be £1584, and the expenditure £1369, leaving a balance of £215.

This report was also adopted.

The subject of the strike at Wigan being urgent, was then brought before the conference. After a long discussion, it was resolved to support the Wigan men, and make a special monthly contribution on their behalf.

The next subject for discussion was, "Shall the time of charging be altered in puddling mills?" It was stated that the general practice at present in all the ironworking districts is to begin charging the puddling furnaces at five in the morning, and (save in the Cleveland district, where a change has been made in the system in accordance with the wishes of the men) charging goes on up to five in the afternoon, with the view of enabling the workmen to finish six heats per day, or shift. This has really caused the working day of the puddler in the forge to amount not unfrequently to 14 hours. The introduction of the short-time system throughout the country has led the ironworker to agitate for shorter hours, and in the North of England a rule has been observed that all charging shall cease at 3 p. m. in the case of men who begun work at 5 a. m. The delegates from the North explained that the most satisfactory results had followed from the new system, and the following resolution was afterward passed: "That at the next general meeting of the Council of the Conciliation Board for the southern district, the operative members should ask the employers to concede to the workmen the same arrangement in charging the furnaces as at present prevails in the North of England, namely: that the charging should commence at 5 a. m. and be discontinued at 3 p. m., the same principle to apply to night turns; and that where there are lodges not connected with the southern board, they are instructed to make personal application to the employers for the adoption of the same system.

A long discussion took place on the method of electing the general council.

It was resolved that the president, vice-president, and eleven delegates should constitute the council, each district to select a delegate to act on that body.

The next question considered was: "Shall the weight per heat of pig iron be altered?" It was urged that puddlers being paid by long weight, and not by imperial ton, their earnings were materially reduced under the present system, which has been much complained of. It was contended that the only fair basis on which to rest wage settlements by arbitration is the imperial ton, by which the contracts and sales are made by makers with consumers. It was resolved, "That the Conference gives full power to the Council of the Association to memorialize the employers in favor of puddlers being paid by the imperial ton, instead of working on what it believes to be the unfair system of long weight, the employers selling their goods by short weight. In the event of the employers deciding to concede the request of the council, the conference gives instructions to the operative members of the Board of Conciliation to invite the employers to a discussion on the matter, with the view of arriving at a satisfactory settlement, and that in the event of the two parties failing to come to a common agreement, the conference is of opinion that an arbiter should be called in." The next subject was, "Shall an arrangement be made to work five heats per day or per shift?" The five heat question is intimately connected with the system of payment by short or long weight, and also with the system of closing the charging of the furnaces at three p. m. After a long discussion, in which the utility of the five heat system was urged, it was resolved to postpone a definite resolution by conference on the subject until the demand for early charging and short weight had been dealt with. A deputation from the Birmingham Labor Representation League then addressed the conference on the subject of direct representation of labor. The method of regulating the rise and fall of wages in the case of millmen and forgemen was next introduced. An advance in wages is founded on percentage in the cases of puddlers who were paid by the ton, but wages agitations have frequently been continued with the mill and forge hands after a settlement has been come to with puddlers, because the method of adjustment has not been exactly determined. After a long debate it was resolved to leave the question to the two conciliation boards for settlement.

The Uses of Zinc.

In France, Belgium and Germany the area of roofing annually covered with zinc is from 40,000,000 to 50,000,000 square feet, and the experience of fifty years shows that it forms a perfectly sound and nearly imperishable roof-covering. In this country its use is unpopular, if we may use the expression, and mainly, we think, because the principles upon which it should be used are yet hardly understood. When first introduced, about the early part of the present century, there were no English workmen who thoroughly comprehended the nature of the material with which they had to deal, and a special knowledge is absolutely necessary. In the first place, the expansion and contraction of zinc under atmospheric influences are greater than those of other metals in ordinary use. Copper, which is very efficient, but rarely used on account of its cost, approaches it more nearly, but the expansion and contraction of zinc is, *pro rata*, nearly one-third more than that of copper. Therefore, in the construction of drips, laps, and other uniting points, it is necessary that, while being sufficiently sound to keep out the weather, a certain "play," to use the technical phrase, should always be allowed. Any attempt to solder together a zinc roof into one homogeneous body is certainly followed by buckling, cracking, and failure, and this was a fruitful source of trouble in the earlier transactions. Another mistake made was, that the zinc used was too thin. The process of oxidation which this metal undergoes is peculiar. The rusted surface does not rub off or blow away, but forms a sort of hard crust of enamel upon the surface of the metal, and, when laid upon boarding which is or may become damp, or exposed to steam or condensation from below, it rusts on both sides. The thin zincs first introduced into this country in this way were rusted through; they then became brittle, and failure was the result. But if the zinc be of sufficient thickness, after a certain period of time oxidation ceases, and we have a body of solid, sound metal, encased above and below by a solid coating thoroughly impermeable to the accidents of weather or temperature, and which requires no painting. To give the exact figures as described in the trade, No. 9 gauge is too thin, and perishes. No. 14 gauge may be generally recommended as sufficient.

There are various ways of laying the zinc. First, it may be laid in a corrugated form without boarding, the trusses of iron or wood of the roof carrying the weight; or one may lay it in what is called the Italian style, on rafters about 1 ft. more or less apart, with a corrugation at each rafter only; or, in a third manner, upon a general surface of boarding, in the manner of a lead flat, the necessary drips, ridges, etc., provided for in the construction, with the extra allowance for expansion and contraction which the peculiar nature of the metal requires.

Machinery is extensively used in the manufacture. The zinc itself (of which the best quality is manufactured abroad by the Vielle Montagne Company, and known as "V. M." zinc) comes over in sheets of various gauges, about 8 ft. long by about 3 ft. wide. This is made into the various forms required for laying at the factory, before it is sent on to the work for fixing. Benches, some of them as long as 12 ft., are fitted with long falling plates (in action they may be described as a long and narrow guillotine); and taking the case of forming a roll for a roof, the sheet is placed upon a flat bench, with its edge nicely adjusted under the long falling slide. This is then forced down with a powerful screw; and, with certain detail appliances which we need not describe, the roll is formed upon the edge of the sheets. A modified application of the same principle, a long falling press, is used in the manufacture of O. G. and trough or semi-gutters.

In other cases, where ornamental forms are required, such as lions' heads, rosettes, or any similar architectural decoration, the work is done by stamping; a mold and reverse are provided; the zinc is stamped to the required form and outline, in as many pieces as may be requisite, and then the various parts are soldered together, and sent away ready for fixing. Any description of architectural decoration, guilloches, enrichments of all kinds, crockets and rosettes for Gothic work, can thus be efficiently carried out, and, supposing only that the thickness of zinc used in the first instance is sufficient, may be considered as practically imperishable. We may quote the large moldings and pediments of the Albert Hall, twenty large towers on the marquis of Westminister's estate, the Belgrave mansions, Grosvenor gardens, and the Alliance Bank, in Threadneedle street, as examples of decorative zinc roof ornamentation, each differing from the other in style and character.

The objections usually entertained to the uses of zinc we may fairly ascribe to prejudice. When first introduced into this country, there were no skilled workmen who understood the material, and consequently "tin men" were employed; they, not understanding the nature of their material, used the zinc too thin, and soldered a roof up together in one piece—like a tea-kettle; hence much of the modern objection to its use, which, however, is rapidly being overcome. Its lightness is its great recommendation, nobody doubts its being much cheaper as a material for a roof than lead; but the public have yet to be convinced that when judiciously employed under competent supervision, it is even more durable. The experience of 50 years in Continental works justifies this assertion, and there is still a farther more important saving in the scantling and general construction of the roofs where it is used.

The manufacture is, to a certain extent, modern, especially with us. Everything, of course, must have its beginning; but with due regard to the various points we have already mentioned, we see no reason why a zinc roof should not be the cheapest, lightest, and most durable, when properly employed, of all the materials we have at our command; while the examples we have already quoted show the facilities it affords for architectural decoration of the highest class.—*The Architect.*

Iron Working at Worsborough.

Joseph Wilkinson, in an interesting work on the history of Worsborough, England, gives some interesting facts with regard to the special industry of that place, from which we take the following:

Worsborough furnace was first worked on the 25th March, 1812, by the late Messrs. Darwin & Co., who not only carried on the ironworks at Worsborough Bridge, but also those at Chapeltown, under the Duke of Norfolk. Those at Worsborough Bridge were afterward carried on by Messrs. Field, Cochrane & Faulds; in later years by Field, Coopers & Faulds; and now by Messrs. Coopers & Co., who have not only carried on the ironworks, but extensive collieries, which for a long time have been worked successfully in the neighborhood, in connection with both the Barnsley and Silkstone seams. But, previous to this time, ironworks had been carried on in the township. It has been said that the iron trade was carried on here during the Roman era, though of this we have no satisfactory evidence; but there is no doubt that at an early period bloomeries or furnaces for smeling iron existed here, as is evidenced by the many mounds of scoriæ which have been found in different parts of the township. These original bloomeries, or air furnaces, were of a primitive character. They were simply contrived, and comprised a low cupola of clay filled with alternate layers of charcoal and ore, fanned by the wind through apertures left for that purpose; they could only be worked when there was a strong breeze, and the fire was regulated by opening and shutting those apertures. This plan was succeeded by the blast furnace, which employed artificial currents of air produced by water-wheels and steam engines, whilst the hot blast furnace, a comparatively modern invention, did much toward bringing the iron trade to the state of perfection which it has now reached. That Worsborough was rich in its mineral product, and that their valuable properties had been ascertained, is patent from the fact of gentlemen connected with other iron districts coming into Worsborough to embark their capital in these works. Although we have no very early records of iron being got in Worsborough, yet at Kimberworth, near Rotherham, in 1161, leave was granted to the monks to dig the ore, *mineram*, through the whole of the manor of Kimberworth. They were not, however, to get more iron than was sufficient for the demand of two furnaces, and were to be allowed as much dry wood as was requisite for four fires—that was, two for smelting and two for working—to be gathered in the woodlands of Kimberworth. In a charter of the early part of the 12th century, Adam Fitz-Peter, lord of Stainborough, made over to the monks of Rievaulx all the iron mines and minerals of that township (Stainborough), with the wood necessary to make charcoal; while, by another charter, Adam, son of Roger Spencer, of Barnsley, granted to the monks of Pontefract lands in Milneholme and Milne Carr, and five acres of the assart *juxta forgiam Rudulphi clerici*. In the reign of Stephen, Godric Fitz-Ketelbern (an ancestor of the Rockleys) gave as much iron ore to the monks of Byland as would supply one furnace, and fuel out of his wood at Emley. The monks of Kirkstead had some bloomeries within a few miles of this place in the reign of Henry II.; the priory of Monk Bretton was possessed of iron mines at its dissolution in 1539, valued at £3. 6 8 per annum, which, considering that the site of the priory and upward of 400 acres of land were valued at only £18. 11 per annum, must be looked on as considerable for those days; and there is no doubt, but that both iron and coal have been obtained in this district from a very early period. Both those iron works were carried on in a limited degree, for such were the difficult modes of transit, the thinness of population, and the primitive appliances in use for smelting iron at that period, that no extensive works could have been carried on, and no markets reached for their produce. The early modes for smelting were slow and difficult, and were performed by wood, or "earth coal," where it could be obtained.

The Effect of Exposure on Coal.

The deterioration which coal suffers by exposure has for some time been the subject of discussion among American metallurgists and engineers. The difference in changes which take place in the various coals is due to the difference which exists in their chemical composition, those which contain the largest proportions of hydrocarbons suffering the most marked deterioration. Mr. H. Engelmann, E. M., of Salt Lake City, U. T., has recently published a discussion of the subject, of which the following is the substance. He says: A large number of interesting experiments on this subject were made by Dr. Richter, professor at the mining school at Waldenburg, in Prussia. Some of his principal results were as follows: As soon as the coal is mined it begins to absorb oxygen, rapidly at first, then more slowly. At first this action appears to be physical, but it soon becomes chemical, when the absorbed oxygen combines with the hydrogen of the coal to form water, and, with the carbon, to form carbonic acid. Heat intensifies the chemical action. Powdered stone coal fresh from the mine, heated to a temperature between 350 and 400 deg. Fahr., increased in weight; although carbonic acid and aqueous vapor are disengaged, more weight of oxygen is absorbed. After a while a rather constant weight is obtained, and, by chemical analysis, the coal is then found to contain oxygen and hydrogen very nearly in the relative proportion in which they combine to form water, which has not been the case in the fresh coal. The property of the coal thus rapidly to absorb oxygen depends mainly upon its proportion of free hydrogen. Of the carbon of the coal only a few per cent. (5 or 6) combine thus rapidly with the oxygen at the stated temperature, while the rest of the carbon is far more stable.

Different stone coals heated to the boiling point of water, until their weight remained constant, would absorb in a humid atmosphere at 60° Fahr., from 2 to 7 per cent. of water, and it was remarkable to observe that some solid pitch coal would absorb three times as much water as a soft laminated coal. The faculty of absorption could not be judged from the appearance of the coal, but coals from the same stratum exhibited considerable uniformity of behavior. The coals which absorbed most water were also those which absorbed most oxygen. Twenty grammes coal absorbed in the first twenty-four hours after mining from 2 to 9 cubic centimeters oxygen. Stone coal absorbs carbonic acid even more eagerly than oxygen, taking up three times as much of it. At higher temperatures, the chemical action of the oxygen is increased, and a slow combustion takes place.

The influence of humidity on the deterioration of coal is complicated. Air dry coal absorbs the oxygen far more rapidly than moist coal, and coal which has been artificially dried absorbs it still more eagerly, taking up at the same time some nitrogen from the air. On the other hand, humidity induces decomposition of the iron sulphuret contained in most coals, which, in turn, accelerates the chemical changes of the coal by creating heat and causing it to split and slack, and probably, also, by inducing chemical action between the oxide of iron formed and the coal, if not between the oxygen and coal directly.

Light appears to exercise little influence. When coal has been exposed some time, and absorbs oxygen with little avidity, this absorption is a little greater in the dark. These were the principal results of Dr. Richter.

An interesting experiment was made some years ago in Germany to test the deterioration by exposure of Silesian gas coal. A quantity of coal slack was divided in three parts. One part was directly used in the gas factory, another after having been housed one month, and the third after one month's exposure in the yard. The relative proportions of gas obtained were 135—111—95. The losses by exposure were, therefore, 17·2 per cent. and 29·5 per cent. The gas coke from the first lot was serviceable; from the second and third lots unserviceable.

It can hardly be doubted that this affinity of the oxygen for the coal has contributed much toward determining the quality of the coal which the different strata now present, but acting slowly in the course of ages, the effect has not been an apparent decomposition, but merely a difference of quality. The bituminous coking and gas producing coals have been least affected. They retain the largest proportion of hydrogen uncombined with oxygen and the least combined. The sinter or sand coals, which coke little or not at all, and furnish a poor gas, contain less hydrogen uncombined with oxygen, and more oxygen and hydrogen combined than if they had been partly deteriorated by exposure. How little chemical equilibrium exists in a coal stratum is evident from the immense amount of carburetted hydrogen gas which is evolved in the coal mines, even in those which are not subject to dangerous accumulations of it in the form of fire-damp, and which, in many, especially in deeper mines, can be heard escaping in minute bubbles from the sides of the rooms, making a peculiar noise. The quality of the roof and the quality and thickness of the superincumbent rock formations have exercised an important influence in determining the quality of the coal strata. Not unfrequently the deeper strata of a coal basin are the most bituminous ones. The more recent brown coals, the coals which are so extensively developed throughout the region of the Rocky Mountains, which are of the cretaceous are, and present the appearance of stone coals, contain generally little hydrogen compared to their large proportion of oxygen. They should, on that account, not be apt to decompose readily, but the large amount of hydroscopic water which they contain, and their lack of cohesive strength, render many of them an easy prey to deterioration by exposure. I have seen many carloads brought into Salt Lake city, of which the uppermost pieces, from an exposure of several days to the scorching sun and drying winds, were cracking and exfoliating very much like burnt lime in a moist atmosphere. These coals would certainly be of superior quality if they had been buried deeper in the bowels of the earth, and protected by heavy deposits of dense rock strata, which would have prevented the loss of so much of their bitumen, and rendered the access of oxygen more difficult. These coals are, however, not equally devoid of bitumen, and a locality in Sampete Valley, U. T., presents a curious example of the influence of a solid casing. Near the village of Wales there is an outcrop of this brown coal, which is far more bituminous than the average. It is encased between solid beds of a slaty limestone, which forms a foot wall and roof of great stability. There is no clay seam or shale intervening. The whole thickness of the bed is about forty inches at this point, which appears to diminish to both sides, but it is not all coal. In its upper part it encloses several inches of slate, and in its lower part an irregular seam of the same slaty limestone, from 0 to 10 inches in thickness. The coal itself is very solid, has a subconchoidal fracture, and, aside from the slate, contains a large proportion of ashes. Thus armor-plated against the inroads of decomposing agencies, it has retained considerable bituminous matter at the cost of purity.

The British Mines Regulation Act.

The new law which went into operation on the 1st of January, promises to give increased protection to life in British mines. In conformity with its requirements, the mine owners have prepared a schedule of special rules, which provide substantially as follows:

The manager or the underground-viewer is to see that careful and steady men are employed every day and night at the ventilating furnaces, or other ventilating apparatus; that the safety lamps are to be so systematically given out, locked and examined, that tampering with them will, in the future, be next to impossible; that a careful system of signalling be adopted between the stopping places and ends of planes; and that there be man-holes for places of refuge at the sides of such planes at intervals of not more than 20 yards; and in horse roads, at intervals of not more than 50 yards. The ventilation is to be a subject of special care and attention, and the underground-viewer, or his deputy, must remain underground until the day's work is finished, and see that the doors and sheets are properly closed, and everything left safe. Every twenty-four hours a competent person is to examine the head gear, working apparatus and working place; and once every week is to examine the state of the shaft by which persons ascend or descend the mine, and make a true report thereon. By another rule, a station, or stations, at the entrance of the mine, or to different parts of the mine, are to be appointed, and a workman is not to be allowed to pass such station until that part of the mine beyond it has been certified to be safe. The underground viewer, or his deputy, is (with a safety lamp), once in every twenty-four hours if one shift is employed, and once in every twelve hours if two shifts are employed, to examine every traveling road or working place before the miners and boys descend, and shall make a chalk mark at each working place, showing the date of his examination, and a true report of the same shall be recorded in a book; and if he finds the road and works well ventilated, and in other respects safe, he shall give a signal to the banksman to that effect; but if danger from gas, or from any other source, be apprehended in any place, he shall not allow a miner or a boy to go there until the danger is removed. When any part of the mine is found unsafe, two rails are to be taken up as a danger signal, and put across each other at the entrance to each place; but the underground viewer or his deputy must also personally warn the work-people of the said danger. Immediate warning must be given of any part of the mine found fiery; or if any stoppage or derangement of the ventilation, injury to air crossings, sheets, stoppings, brattices, be discovered, then due notice must be given of the same, both to the work-people and the underground viewer or his deputy. No intoxicated person to be allowed to enter the mine, or to remain about the premises. Wages are to be paid in money, at the pay office of the mine. The remainder of the special rules are devoted to the specification of the duties of the various officers connected with the mine, and laying down strict orders of the manner in which they are to carry out their duties.

Mr. Cyrus W. Field has placed the cables at the free disposal of the scientists of both hemispheres, for the purpose of reporting the discovery of astronomical phenomenon, such as new discoveries of planets, comets, remarkable changes in the sun, etc.

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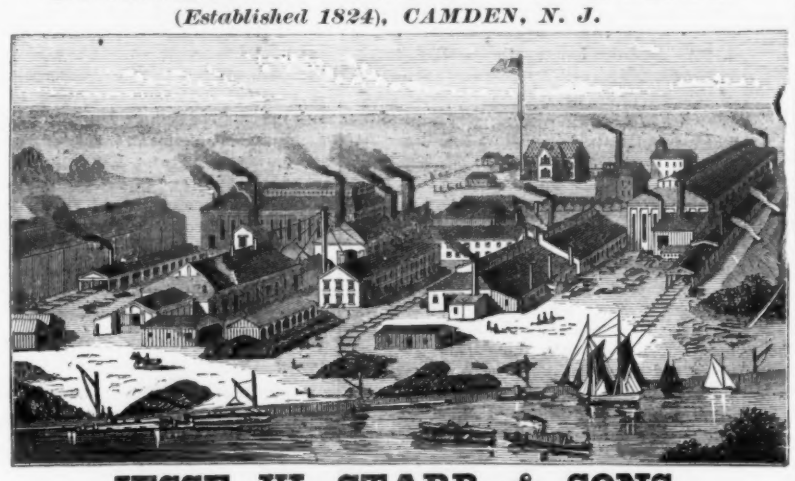

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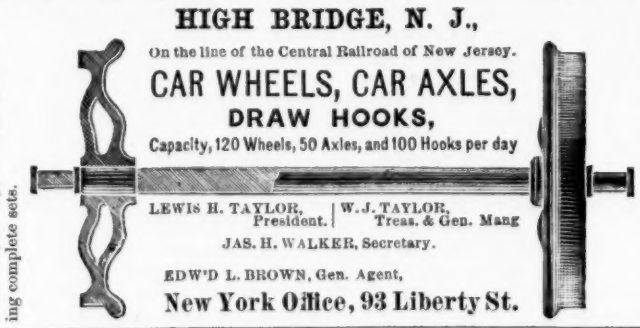

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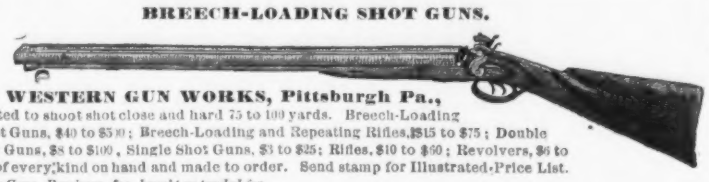

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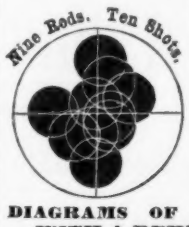

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FROM "DIE METALLURGIE" OF C. STOETZEL.*

If steel is heated to glowing, and if it is then suddenly cooled off by a liquid or in another proper manner, it experiences a very remarkable and thorough change; it becomes considerably harder, increases in elasticity and solidity, expands, and, if not overheated, attains a fine-grained, dense texture, of light color. The change taking place by hardening is the more striking: 1, the greater the difference in temperature applied; and, 2, the quicker the heat was withdrawn to the heated material. Hence, by either modifying the temperature, or by changing the material, during the cooling off, or by modifying both, various properties may be imparted to steel. Simple as this appears at the first glance, many and great are the technical difficulties which present themselves in practice. The hardening belongs in fact to the most difficult operations; it requires much practice and attention, and the final quality of the steel depends upon it not less than its original utility.

The temperature to which steel can be heated before cooling, if it shall not be deprived of its good qualities, lies within close limits, viz.: between the brown red and bright red (rose red) glowing heat. It is objectionable to heat the steel at first more than necessary, and then to let it cool to the required degree before cooling it. Since there exists no reliable means and apparatus which allow us to recognize with certainty the various degrees of glowing, we must depend upon the eye, which, however, is subject to many delusions, according to the locality, illumination, etc., and this the more, the more differences of temperature, which make themselves apparent by only slight changes, are of essential influence. Another difficulty exists therein, that every kind of steel requires, as it were, to be treated in its own manner, which is often the cause that the most skillful workmen rejects a good material to which he has not been used.

In order to impart to steel the highest degree of hardness together with great solidity and elasticity, it is necessary that the different brands be heated to various degrees of temperature. Those kinds which are poor in carbon, as well as the soft and ordinary ones, require a higher temperature before cooling than those richer in carbon, such as shear steel and furnace steel. Beside, steel is the more easily hardened the more it has been condensed by hammering and the finer its grain has become. If it is to possess more hardness than elasticity it must be heated to a higher temperature and cooled quicker than if the opposite qualities are desired.

But, since with all precaution it is not always possible to strike the proper temperature in heating and cooling, so that the steel will attain the desired degree of hardness and elasticity, it receives generally its full hardness (glass hardness), and the same is then toned down by annealing, but it is to be noticed that a false treatment of the steel during hardening cannot be remedied by annealing. If it has become too soft, the hardening is to be repeated again.

ON THE HEATING IN HARDENING.

One of the most essential conditions in hardening consists in rapidly heating the whole mass. Greater pieces are heated in the open blacksmith's fire with blast, or in properly over-arched heating furnaces, and by using charcoal or good coke that is free from sulphur. Tools of unequal strength are put in the fire with their thicker end. The coals must glow well and ought to burn without flame or sparks, so that the workmen may well observe the heat of the steel, and may surround it uniformly, so that it be not exposed directly to the blast. For smaller articles an ordinary charcoal fire without blast suffices, and instead of the open fire, it is often heated in muffles or in boxes and packed in coal dust. Many articles are also heated in the flame, or by aid of the blow pipe.

If only certain parts of a piece are to be hardened, and if others are to remain soft, it is often usage to coat the latter with clay, so that they may be less exposed to the heat, and may not come into intimate contact with the hardening liquid. Wherever packing in coal dust is not desirable, such a protective coating is necessary, in order to preserve engraved plates, stamps, &c., from the formation of scale during heating or the immersion in water; moreover, in files, to prevent the burning of the teeth. For this purpose various means are applied. The files are generally immersed in a solution of salt, thickened with flour or yeast, and are placed in the fire after the coating has dried. Other articles are coated with soap, and various mixtures are also being used, which, at the same time, produce a greater surface hardening. (For these see below.)

In order to produce a uniform heat, metallic baths, especially glowing, liquid lead, has been recommended. However, this manner of proceeding is in general of little use, because the ordinary metals which may be applied for this purpose have too low a melting point, and because, if the metal baths are over-heated the principal advantage, a high temperature, is lost; lastly, the preparation of more or less fusible alloys is costly and difficult. For smaller articles, such as razors (according to Chesterfield, in Sheffield), one may use with advantage a bath of salt, calcined soda, chloride of zinc, and other neutral mineral salts heated to redness.

ON TEMPERING AND TEMPERING COMPOSITIONS.

For this purpose partly liquid bodies, partly solid bodies, and even the air, find application. Since the effect of the substances for tempering depends upon the rapidity with which they withdraw heat, their temperature is of influence on the one hand, and on the other their conductibility and capacity for heat, their size, and with regard to liquids, also, the rapidity with which they come in contact with the steel, for it is well-known that by immersing a glowing metal in water and watery solutions, formation of steam takes place, which surrounds the article to be hardened.

In experimenting with different tempering compositions, Caron has obtained the following results:

	Water.	Water.	Water with 10 % dextrin.	Alcohol of 36 % in volume.
Temperature of the liquid before hardening	50° F.	122° F.	50° F.	50° F.
Temperature of liquid after hardening	71° F.	142° F.	73° F.	87° F.
Duration of cooling of the metal	4m. 7.	11m. 3	13m. 2	21m. 7
Character of the tempering	good	feeble	very f'ble	none

The tempering liquid most commonly used is cold water. The ancients already employed the same, as well as oil, and we find the opinion prevalent that certain rivulets and wells were especially suitable for this purpose, for which reason, according to Pliny, steel works were often erected in their vicinity, and at a distance from the mines. We know now that this belief has a certain foundation only inasmuch as the temperature of the water and its amount in mineral ingredients exerts an influence; but, otherwise, every pure water can equally well be used for tempering. The lower its temperature—which, however, should not be below the freezing point—the harder will be the steel. Cooled in warm water, it becomes softer; in boiling water no remarkable hardening takes place, although remarkable molecular changes may otherwise be produced. If many large pieces are to be hardened consecutively, it is necessary, in order to obviate a gradual increase of temperature, to renew the water by a regular efflux and influx.

In order to cool the articles rapidly, they are ordinarily drawn in a circle in the liquid until the hissing noise ceases, so that they may come well in contact with the liquid, and in many cases a stream of water is allowed to flow upon them. All substances that increase the conductivity for heat of the water, produce also a higher degree of hardness. The larger or smaller percentage of calcareous matter exerts a certain remarkable influence; beside, various substances are sometimes added to it, for instance, oil of vitriol (1 part to 30 or 40 parts of water), which the English file cutters regarded as a great secret. Again, there is being used nitric acid, potash, nitre, sal-ammoniac, prussiate of potash, common salt, crystals of tartar, etc. In some cases, where no fresh cold water is at hand, such additions may be very useful, but they may in general be dispensed with. A still higher degree of hardness is produced by cooling in mercury. Owing to its great conductivity and its small capacity for heat, it should, however, be surrounded with water. If, aside from hardness, the steel is to attain as much elasticity as possible, less cold water should be employed, and its conductivity ought to be lessened by certain additions. For this purpose may be recommended soap *in small quantities* (soap-water does not harden at all), and slimy substances, or badly-conducting pulverulent bodies, such as small charcoal, moistened with water, may be used.

Aside from the water and watery fluids, fat oils and fats proper render valuable services, especially in cases where the greatest hardness is not to be given to steel and where warping is to be prevented. They find, therefore, application for tools, swords, pens, needles, and even for larger massive pieces, such as cannons.

Wax, soap and resins and petroleum, in the Orient, are used for the same purpose. In Switzerland, according to A. Kieser, cast steel for cutting-tools is hardened in a remarkably excellent manner by dipping it, in a dark red condition, into a mixture of four parts yellow rosin, two parts train oil and one part molten tallow, whereupon it is again placed in the fire without cleaning, and then cooled in water. Flat articles, such as saw-blades, are also cooled by pressing them between cold plates, or even by the air only, by blowing upon them with the mouth, when small, or by moving them rapidly to and fro. The blades of Damascus are said to be fastened to wheels in a glowing state and then hardened in the air by rapidly turning them.

Since, by the operation of hardening, steel generally attains a higher degree of hardness than it is to retain finally, and since this fault must again be corrected by annealing, it is evidently more rational to cool it rapidly only to that temperature which it would receive in annealing, and then to effect the final cooling more or less rapidly, according to circumstances. Such a procedure, where hardening and annealing are combined in one operation, has been found useful for various purposes, and deserves every consideration. For hardening saw-blades, for sugar-rasps in sugar refineries, and for other articles which are to get as hard as a steel spring, Treviranus found the insertion of the red-glowing objects into a bath of molten lead very suitable. Objects requiring a greater hardness require a tin-bath.

ON FLAWS AND ON WARPING.

There is one great defect which sometimes shows itself in hardening—namely: That in consequence of unequal contraction, the articles alter their form, or warp themselves, or get flaws or cracks. Owing to a disproportionate tension of the steel-molecules, a complete bursting or a violent detaching of particles sometimes takes place, and that not always immediately during cooling, but often after several hours. The cause of this phenomenon may be due to various circumstances: first, to the unequal strength of the various parts of an article; then (in larger and massive parts), to the fact that, by the rapid cooling, the exterior layers contract more than the still hot core; and, finally, it may be owing to the heterogeneous nature of the steel, to unequal heating, or to the faulty manner of immersion into the hardening-liquid. Hence, a particular method of treatment is necessary in every special case, the most varied tricks being employed in order to avoid said defects. Long pieces, which are not flat, as for instance, files, must be immersed in the direction of their longitudinal axis, and then moved about in the water with a certain rapidity. Flat and thin articles are to be immersed with their thinner edge. If the objects, as knives and sword-blades, possess a wedge-shaped form, they are generally inserted with their thicker end, which cools off more slowly than the thin one; however, the opposite method may be recommendable, namely: In cases where the edge is made of another material than the back, and when fatty substances are being used for cooling.

It is very important to immerse the entire glowing part of the articles into the hardening-water, or to immerse them completely, according to circumstances, otherwise they attain flaws on the water line. Larger objects should not be withdrawn until they are completely cooled. With regard to the change of form which certain metals attain when partly inserted into cold water in a glowing state, we possess very instructive experiments by Clerk, in Woolwich. He made use of cylinders of various dimensions, consisting of cast iron, wrought iron, steel, tin, zinc and common bronze. Cast iron and steel exhibited after the first immersion a smaller diameter above the water-line; wrought iron showed less alteration of form. Cast iron could be heated and cooled for twenty consecutive times before a tearing of the cylinder took place, yet it exhibited numerous fissures on its surface. Wrought iron stood heating for fifteen or twenty times before it got fissures on its surface, and a hollow cast iron cylinder broke after the fifth heating immediately below the water line. It may also be mentioned that tin showed no alteration of form, and that brass, cannon bronze and zinc showed a contraction above the water-line instead of an expansion. Tools whose edge or point consists only of steel are only immersed with this part into the hardening liquid, the heat of the other metal being made use of for the purpose of annealing the hardened steel by observing the annealing colors at the same time. But, as experience teaches that thereby cracks are readily produced, it would be more practical to immerse the articles completely, and then to anneal them by themselves. Since flaws are produced less easily when the cooling is performed in fatty substances instead of water, the water is often covered with a layer of oil or fat, through which the steel has to pass first before it reaches the water.

To warping most articles of irregular form are exposed, for instance, hollow chisels, half round files, etc., or such that consist of wrought iron and are plated with steel on one side. In these cases the steel side gets easily crooked; hence it is necessary to immerse the object in a particular manner and to move it about in the liquid in a special way. It may also be well to bend it in the opposite way during forging, so that they may get straight in hardening. Articles of very unequal dimensions, such as eccentric rings, are lined with a piece of iron at the thinner places, so that they may be uniformly heated and cooled. Small articles that are also long, and would therefore warp easily, are packed into fagots by means of wire, heated and cooled; flat articles, as already mentioned, may be retained in their form by pressing and cooling them between iron plates.

There is one condition to be fulfilled which is of essential influence for the process of hardening, namely, the previous working of the steel. If the surface thereby produced is denser in one place than in another, one may be certain that it warps itself in hardening; hence not less depends upon the dexterity of the smith than upon the workman who performs the operation in question. Since, in certain forms, an unequal density cannot be avoided, the article should be brought to a low red heat before being hardened, and if it has become bent, it should be straightened out. Large articles should first be hammered out well on the surface, so that this latter may become denser. With steel rollers this may be done by adjusting them into a frame, and by allowing steel rails to pass through them under heavy pressure. According to the experience of Ede, in the Arsenal at Woolwich, steel with a brilliant metallic surface is more readily exposed to flaws than steel with a thin skin of oxide.

* Translated for *The Iron Age*, by Dr. Adolph Ott.

A Barnsley correspondent of the Sheffield *Telegraph* says: A vast and valuable field of coal, extending for many miles, is about to be opened out at Worsborough, near Barnsley. It may not be generally known that what is known in Yorkshire as the "Barnsley Bed" of coal, and in Derbyshire as the "Top Hards," is the most extensive mineral field in England, extending from a point close to Nottingham, its southern extremity, to the northwest of Normanton, a distance of more than 60 miles in a straight line. Below the Barnsley seam is the Silkstone seam, one of the finest in the kingdom, either for gas or household purposes, the distance between the two beds averaging 380 yards. The Silkstone seam has so far only been worked, but it is now proposed to sink, through the intervening strata, to it on the estate of Mr. Edmunds, of Worsborough Hall; the Barrow Iron and Steel Company having just secured 900 acres of the coal, and in all probability will take a much larger area. It is understood that the Barrow company will make the greater portion of the coal raised into coke for supplying their many furnaces. Thus a really new field will be opened out, containing many million tons of coal, and embracing an area that can only be computed by miles. It may be said that Mr. Hull, in his work on coal fields, states that at one time the Silkstone coal must have covered an area of 10,000 square miles.

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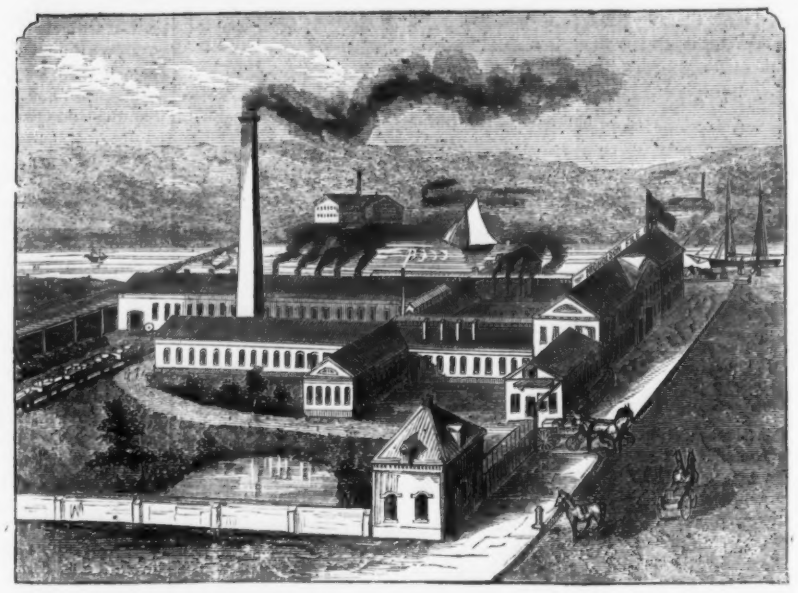

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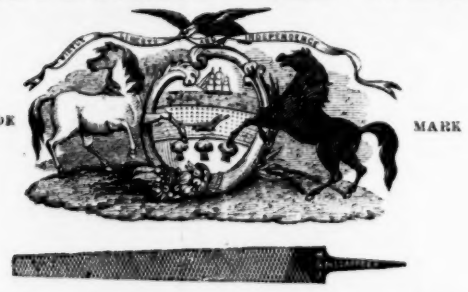

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Fig. 1—Shows Hanger with the Projection (A) corresponding with the Brace (D) of the Rail.

Fig. 2—Shows the Rail with Double Brace (D and E).

Fig. 3—Shows Sheaf with Cas Axle (B) and Shoulder (C).

Figs 4 and 5—Show chills used to chill the Axle (B) and its bearings.

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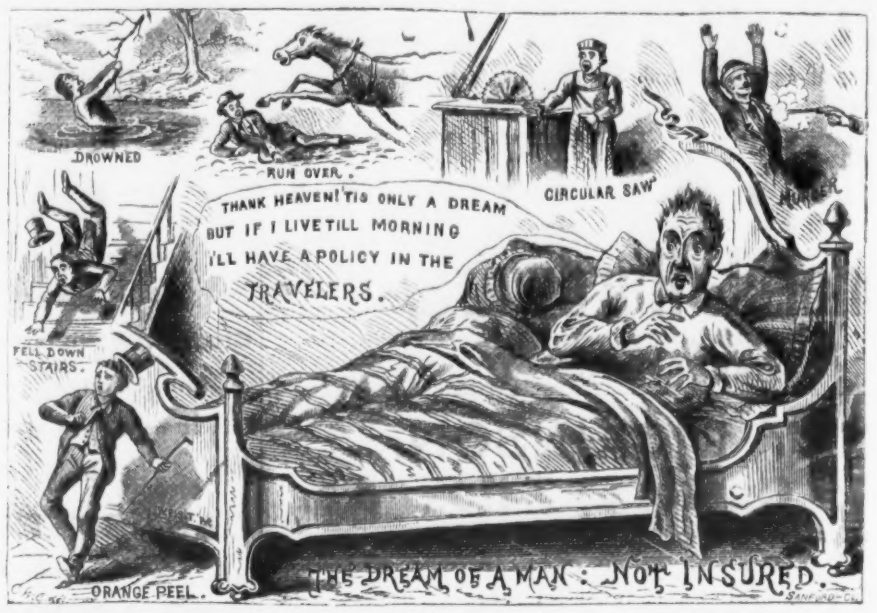

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BUSINESS ITEMS.

PENNSYLVANIA.

The Allentown Rolling Mill Company furnishes rails for the Central and Northern Pacific Railroads, and has just sent out three thousand tons for a new road running from Milwaukee.

The rolling mill in Bristol which has been lying idle for several years, has been leased to a firm which purposes putting it in operation as soon as the necessary repairs and alterations can be made.

Westerman's Rolling Mill, at Sharon, is standing still with no immediate prospect of starting, as no terms have been agreed upon between the company and their employes.

Two thousand tons of railroad iron have been shipped to Toledo by the Pennsylvania Company for that end of the Toledo and Woodville Railroad, and one hundred tons are already on hand and being laid down rapidly.

The American Iron Works of Pittsburgh now give employment in various capacities to about 3000 hands.

A forge company has been organized in Erie, Pa., with George W. Starr as secretary, William Spencer, clerk, and J. L. Russell, treasurer. They propose to manufacture car axles and other forgings.

We are informed that a tract of land of 900 acres, containing rich magnetic iron ore, situated on Lake Champlain, has been leased by the Thomas Iron Company, of Pennsylvania.

NEW YORK.

The village of Clinton, Oneida county, N. Y., is about to have a new blast furnace. Iron ores are abundant in the locality.

CONNECTICUT.

The contract for the new iron bridge over the Potomac, on the site of the chain bridge, has been signed, and the bridge is now being made in the foundry in New Haven. It is the intention of the contractor to have the work done by the 1st of July next.

The citizens of Southington are making strenuous efforts to induce the Beecher Manufacturing Company, recently organized at Meriden, to locate in the former place.

We are informed that the Farrel Foundry and Machine Company, of Ansonia, are receiving a $40,000 invoice of government cannon.

OHIO.

The Buckeye Engine Company, of Salem, are now employing about 150 men, and have in operation 26 lathes, 11 planers and shaping machines and 10 drill presses. Their works cover nearly three acres of ground, and most of the buildings are two stories high. This company was organized on the joint stock plan, with its present name, last year, and is the successor to Sharps, Davis & Bonsall, who commenced business in 1849.

The Mansfield Machine Works employ 220 hands in the manufacture of cars, of which they have turned out about 600 since last May. Their foundry has three cupolas, with a capacity of 80 tons per day. They are now building 200 box grain cars for the Erie Railroad.

The stockholders of the Canton Wrought Iron Bridge Company have resolved to increase the capital stock of the company $50,000, making it amount to 150,000.

The work on the new furnace of 16 feet bosh which is being built by the Union Iron Works Company, Cleveland, is being rapidly pushed forward, and the furnace will go into blast about the beginning of January.

The Massillon Coal and Iron Company, of Massillon, organized with a capital of $100,000, in shares of $100, for the urpose of building a rolling mill and engaging n the manufacture of iron, was incorporated las week.

A. B. Classman, Clyde, manufacturer of the giant finishing shears, ha been established in business three years. His manufactory occupies a two story building 30 by 40 feet, and he employs twelve men.

The Racoon Mining and Manufacturing Company, Greenup, propose to build their furnace stack five feet higher.

The contract for building an iron snag boat for the United States government was recently awarded to Mr. Thom, of Cincinnati, for $112,500. Five other boats are to be built, and St. Louis aspires to have the construction of them.

MICHIGAN.

There is some talk of starting a factory at Marquette for manufacturing wire rope and wire cable.

An organization, to be known as the "Huron Bay Slate and Iron Company," has just been perfected. The operations of this corporation for the present will be confined to opening one of the slate deposits which is on the property it owns on Huron Bay. Work will be inaugurated at once, for the purpose of securing a large quantity of roofing slate, and having it ready by next spring to put into the market.

McDonald's machine shop, at Lapier, was burned Dec. 21. Loss, $25,000.

KENTUCKY.

Lyons county is in an enthusiastic condition over the recent discoveries of immense beds of iron ore. A large hill on the route of the Elizabeth and Paducah Railroad, is said to be one solid mass of ore. The hill is about 1000 feet broad at the base and 100 feet high, and the railroad winds around its base. The mines are owned by the brothers Henry and Edward Machen, who are working them and shipping ore to Cincinnati, receiving $3 per ton on the cars. The ore banks of Ex-Gov. Anderson are also being worked, and are said to be extensive enough to supply the demand of the whole United States.

A new furnace will soon be erected at the Lambert Ore Banks, which is to be 50 feet high, with three tuyeres and a bosh of 13 feet, and which will make 10 tons of iron a day.

INDIANA.

Evansville has in course of erection a rail mill, and is now agitating the subject of putting up blast furnaces. There is an abundance of iron block coal within 40 miles of the city, easily accessible by railroads already completed or soon to be finished. The cold short iron ore in Hardin county is only 80 miles away, and a railway will soon be in operation between that section and Evansville, while the Missouri ore can be transported to the furnaces very cheaply. It is estimated that iron of good quality can be made at a cost of only $23·62 per ton. An effort is being made to organize a company to carry out this project.

The machine shops of the Evansville, Terre Haute & Chicago Railroad, in Terre Haute, were burned yesterday evening. Loss, $30,000.

GEORGIA.

Messrs. Pool, Dodd & Co. have recently purchased a valuable property 13 miles distant from Rome, on the Etowah River, and will erect a furnace as soon as practicable.

Messrs. Rogers & Leyden are erecting a furnace at Limekiln, near Kingston, in Bartow county. Their stack is up and the machinery in place.

The Ætna Iron Works began operations on the 6th day of last April on a capital stock, all paid in, of $75,000. They own nearly 9000 acres of land. Their works are situated 21 miles from Rome on the S. R. and D. Railroad, and their ore beds within a few rods of their furnace. For 200 consecutive days the products of the furnace have averaged 10 tons per day, making a total product of 2000 tons. This iron has netted them at the works $50 per ton, while the entire cost of production has been but $18 per ton. Their net profit of $32 per ton has realized in less than seven months the sum of $64,000. No doubt is entertained about running this amount up to $100,000 by 6th of April next, which will be a gain of 133 per cent. upon the original investment, within the space of twelve months.

ALABAMA.

The Cornwall Iron Works in Cherokee county, is an old established company owning an extensive deposit of red fossiliferous ore, which nets 65 per cent. outside of all waste. This company is now doing better than ever before, yielding 60 tons per week of very superior iron. The Tredegar Company, of Richmond, is their principal customer. The Memphis Branch Railroad will soon be completed to these works, which will render them much more valuable on account of saving in transportation. The capital stock is $100,000.

MISSOURI.

It is expected that extensive steel works will be soon established in St. Louis by the aid of Pittsburgh capital.

VIRGINIA.

The "Chilhowee Iron Company," recently chartered, will soon erect an iron furnace at Marion. The capital stock of the company is to be not less than forty thousand dollars, nor more than five hundred thousand dollars. The following officers have been elected: President, Floyd B. Hurt; Directors, General William Mahone, G. W. Palmer, Thomas E. Garner, Albert J. Snow.

CALIFORNIA.

Measures are on foot for the establishment of a foundry in the neighborhood of San Diego, and a portion of the machinery has already been shipped.

San Francisco Boiler Works are constructing two boilers for the Original Amador Mine, 50x16, with all appurtenances, heaters, etc. They are also making two boilers for the Erie Mine, same as above, and two for the Markley Mine, of a similar size. Two boilers of the same size are being manufactured for the Black Bear Mine, which are made in sections, for convenience in shipping.

The Etna Iron Works, San Francisco, are at work putting up a large steam plow, Hyde's patent. They are also arranging steam machinery for plowing tule lands near Sherman Island, and are constructing a number of Varney pans and mixing machinery for the Bay Sugar Refinery.

CANADA.

At the Caledonia Works, Montreal, peat fuel has been used, mixed with mineral coal, in the melting of iron, and it is said that this iron assumed, although actually cast, many of the properties of its wrought or fibrous qualities.

Four new narrow gauge roads are projected in Utah.

It is reported that rich gold quartz has been discovered at Silver Bay, in Sitka.

Wisconsin lead mines have yielded $30,000,000 worth of lead since their discovery.

The coal tonnage of the Schuylkill Canal for the year ending November 30, 1872, was 838,190 tons.

At Chatham, England, on Dec. 12th, the keel plates of the Superb were laid, which will be the largest ironclad in the British navy.

Boston has now a first-class floating fire engine, capable of doing great service in case of fire on the city wharves, or among the shipping.

Wooster, Ohio, claims that oil, iron and salt have been discovered in that vicinity. A stock company has been formed.

In New Zealand, a very large deposit of brown hermatite ore, containing 75 per cent. of iron, has been discovered near Launceston.

The shipments of coal from Cumberland, Md., by the Chesapeake and Ohio Canal during the season of 1872, were 814,365 tons. Of this 780,951 tons went to Georgetown or Alexandria, the remainder going to way points.

The coal shipments over the Pennsylvania and New York Railroad for the year ending November 30, 1872, were, anthracite, 680,967 tons; bituminous, 237,191 tons; total, 918,158 tons.

Four iron companies in the North of England district have each more than 150 puddling furnaces, and three have from 100 to 150 each.

There was recently discovered near Staunton, Va., a large deposit of red hematite iron ore, probably [illegible] and containing several [illegible]

Saws.

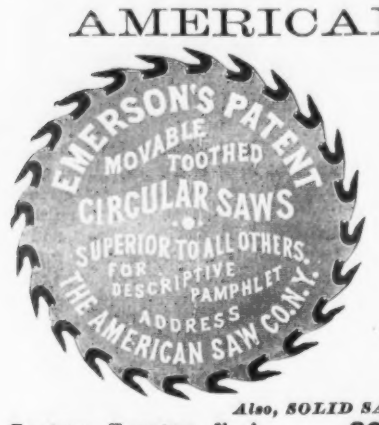
H. W. PEACE,

MANUFACTURER OF

SAWS OF ALL KINDS.

FACTORY, WILLIAMSBURGH, N. Y.

AMERICAN SAW CO.

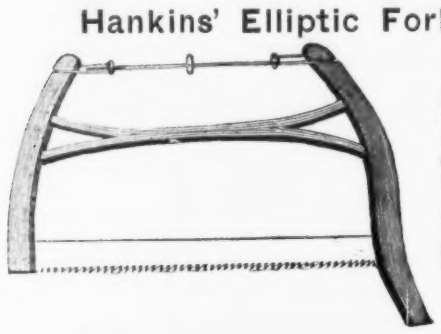


Also, SOLID SAWS OF ALL KINDS.

Factory, Trenton N. J. Office, No. 1 Ferry St., cor. Gold St. N. Y

Hankins' Elliptic Forked Saw Frame.

Patented June 28th, 1870.



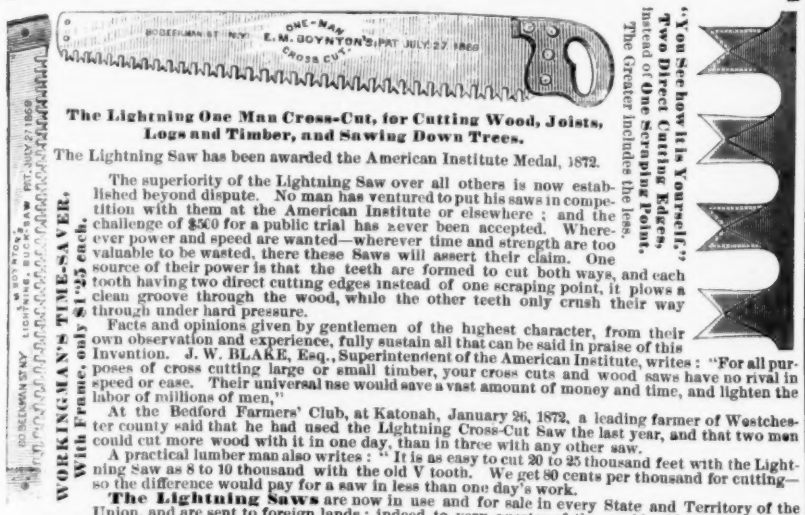
The annexed engraving represents HANKINS ELLIPTIC FORKED SAW FRAME, which commends itself to the trade for its simplicity of construction. The Forked Brace being all in one piece, without any centre bolt, secures for the Frame great strength and durability.

These Frames are put up with my best Webs, marked "No. 40, Harvey W. Peace.

HARVEY W. PEACE,
VULCAN SAW WORKS,
WILLIAMSBURGH, N. Y.

BOYNTON'S LIGHTNING SAWS.

Front Edge View showing two points of M tooth dressed to cut in line on one side, and two on the other.



The Lightning One Man Cross-Cut, for Cutting Wood, Joists, Logs and Timber, and Sawing Down Trees.

"You See how it is Yourself." Two Direct Cutting Edges, Instead of One Scraping Point. The Greater Includes the less.

The Lightning Saw has been awarded the American Institute Medal, 1872.

The superiority of the Lightning Saw over all others is now established beyond dispute. No man has ventured to put his saws in competition with them at the American Institute or elsewhere; and the challenge of $500 for a public trial has never been accepted. Wherever power and speed are wanted—wherever time and strength are too valuable to be wasted, there these Saws will assert their claim. One source of their power is that the teeth are formed to cut both ways, and each tooth having two direct cutting edges instead of one scraping point, it plows a clean groove through the wood, while the other teeth only crush their way through under hard pressure.

Facts and opinions given by gentlemen of the highest character, from their own observation and experience, fully sustain all that can be said in praise of this Invention. J. W. BLAKE, Esq., Superintendent of the American Institute, writes: "For all purposes of cross cutting large or small timber, your cross cuts and wood saws have no rival in speed or ease. Their universal use would save a vast amount of money and time, and lighten the labor of millions of men."

At the Bedford Farmers' Club, at Katonah, January 26, 1872, a leading farmer of Westchester county said that he had used the Lightning Cross-Cut Saw the last year, and that two men could cut more wood with it in one day, than in three with any other saw.

A practical lumber man also writes: "It is as easy to cut 20 to 25 thousand feet with the Lightning Saw as 8 to 10 thousand with the old V tooth. We get 80 cents per thousand for cutting—so the difference would pay for a saw in less than one day's work.

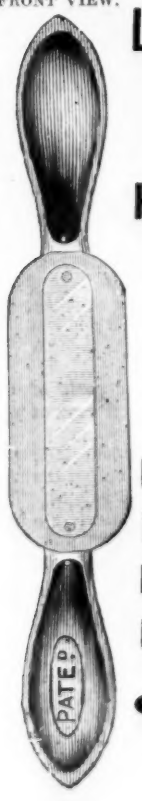
The Lightning Saws are now in use and for sale in every State and Territory of the Union, and are sent to foreign lands; indeed to very quarter of the world. More than 100,000 purchasers during the year 1872 add their testimony to the claims of superiority of the Lightning Saws.

These Saws are of all sizes, from the fine hand-saw of one foot long, to the ten-feet California Cross-Cut. Two men can use the one-man Saw, by attaching one of Boynton's Patent Handles, removable at pleasure. Many imitations are abroad that are deficient in some essential features, and I am prosecuting infringers in the United States Courts. **None** are genuine unless they bear the name of E. M. BOYNTON, and the date to coil to touch ends without injury. A six-feet Cross-cut and a Buck-saw blade will be sent for Six Dollars.

For Catalogue, Price List and additional information, please address

E. M. BOYNTON,
Sole Proprietor and Manufacturer, 80 Beekman St., New York.

FRONT VIEW.



BACK VIEW

LLOYD, SUPPLEE & WALTON,

WHOLESALE

HARDWARE HOUSE,

AND

HARDWARE FACTORS.

BATES' MANUFACTURING CO.'S GOODS.

Bonney's Pat. Hollow Augers & Spoke Trimmers.
Bonney's Patent Double-Edged Spoke Shave.
Bonney's Patent Adjustable Gate Hinge.
Bonney's Patent Sash-Fast and Lamp Bracket.

625 Market Street,
PHILADELPHIA.

Cutlery.

Landers, Frary & Clark,

53 Chambers and 31 Reade Streets, New York,

MANUFACTURERS OF

TABLE CUTLERY

OF EVERY DESCRIPTION. ALSO,

General Hardware,

IN VERY GREAT VARIETY.

53 CHAMBERS ST., N. Y.

HENRY DICKINSON,

Sheffield Cutlery, Files, &c.,

66 & 68 READE STREET (near Broadway), NEW YORK.

Manufactory, SHEFFIELD, ENGLAND.

Isaac Milner's Fine Pocket and Table Cutlery.
Howard Bro.'s Medium Pocket Cutlery.
J. B. Osberton & Co.'s Medium Table Cutlery.
Isaac Milner's Razors, Butcher and Hunting Knives.
Hargreaves, Smith & Co.'s "Imperial" Files.
Milner's "$\frac{1}{2}$" and Collins' "**IXL**" Hand Saws.

Notice of Removal.

ASLINE WARD,

From 54 Beekman St. to No. 101 and 103 Duane St., N. Y.

REPRESENTING

GEO. WOSTENHOLM & SON
CUTLERY AND RAZORS,
WASHINGTON WORKS, SHEFFIELD.

CORPORATE MARK.

I X L

FRED'K WARD & CO., SHEFFIELD,
CUTLERY & TABLE KNIVES.

CORPORATE MARK.

B4 * ANY

H & J. W. KING
ENGLISH
HARDWARE.
WOSTENHOLM'S
IXL
POCKET KNIVES,
KNIVES & FORKS,
RAZORS,
SCISSORS, FILES, CHAINS,
ANVILS, VICES,
GUNS.
80 CHAMBERS ST. NEW YORK

CORPORATE MARK,

* ✠

Joseph Rodgers & Sons'

(LIMITED)

CELEBRATED CUTLERY,
No. 82 Chambers Street, New York.
CHARLES PEACE, Jr., Agent.

NOTICE.—The public is warned not to purchase as JOSEPH RODGERS & SONS' goods Cutlery stamped "ROGERS & SON" (note the absence of the letter D), with the star and Maltese cross, for such are spurious. Joseph Rodgers & Sons will thankfully receive from the trade information touching any such or other violation of their name and trade-marks, their determination being to continue to enforce the laws against such infringements.

New York, Oct. 2, 1871.

JOSEPH S. FISHER,

No. 411 Commerce St., PHILADELPHIA,

AGENT FOR

George Wostenholm & Son,
Washington Works, SHEFFIELD,
Celebrated I-XL Cutlery, Razors, &c

SOLE AGENT FOR THE UNITED STATES OF

WALTER SPENCER & CO.,
Steel and File Manufacturers,
Rotherham, ENGLAND.

Corporate Mark.

N SPENCER ROTHERHAM

Granted 1777.

RICHARD A. TURNOR,

37 Chambers St., New York,

Agent for

F. W. HARROLD,
Hardware Commission Merchant,
BIRMINGHAM.

JOSEPH ELLIOT & SONS,
Manufacturers of Razors, Table Knives, &c.,
SHEFFIELD.

ESTABLISHED 1852.

NEW YORK KNIFE CO.

MANUFACTURERS OF SUPERIOR

Table & Pocket Cutlery,

WARRANTED TO BE MADE OF THE BEST MATERIAL.

WALKILL RIVER WORKS,
Walden, Orange Co., New York.
THOS. J. BRADLEY, President.

The Miller Bros. Cutlery Company,

Manufacturers of Patent

FINE PEN AND POCKET CUTLERY,

WEST MERIDEN, CONN.

We warrant our Knives equal in cutting qualities and workmanship to any made. We also make

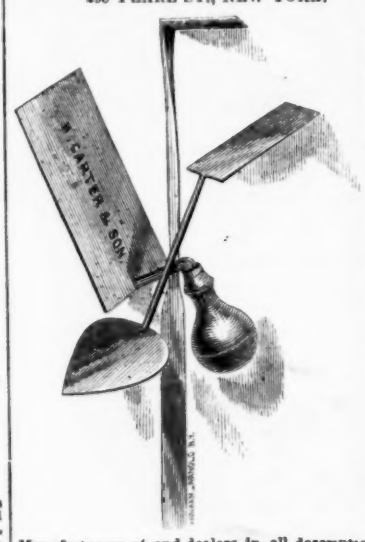
SILVER PLATED POCKET KNIVES,

which will not rust or become discolored when used as a Fruit Knife, and their cutting qualities are equal to any other Knife.

CLARK, WILSON & CO., Agents,
81 Beekman Street NEW YORK.

H. CARTER & SON,

290 PEARL ST., NEW YORK.



Moulders' and Plasterers' Tools.

Manufacturers of and dealers in all descriptions of Molders' and Plasterers' Tools, and dealers in

General Hardware, Gilded Copper Weather Vanes, CARTER'S PATENT CARRIAGE LIFTING JACK, &c

Ornamental Wood Co.

Bridgeport, Conn.

MANUFACTURERS OF

Cabinet Ornaments and Trimmings

OF

Natural Woods,

in great variety of form,

Door Knobs, Escutcheons, Shutter Knobs,
Panel and Tablet Ornaments,
Drawer Pulls, Medallions, Rosettes,

LION HEADS, JEWEL BOXES, SLEEVE BUTTONS, etc., etc.

A new Illustrated Catalogue and Price List will soon be out for 1873, containing many new designs useful to the trade. This Company has no offices other than at factory, Bridgeport, Conn., and No. 5 West street, London, England.

Saws.

WHEELER, MADDEN & CLEMSON

Manufacturers of Warranted Cast Steel

SAWS

OF EVERY DESCRIPTION,

including

Circular, Shingle, Cross Cut, Mill, Hand, Roberts' and other Wood Saws,

&c., &c.

CAST STEEL FILES

of the well-known brand of

WHEELER, MADDEN & CLEMSON.

FACTORIES:

Middletown, Orange Co., N. Y.

BRANCH OFFICE:

97 Chambers Street, New York.

Brundage Forged Horse Nails,

Manufactured from

BEST NORWAY IRON,

by BRUNDAGE & CO. Sold by

Wheeler Madden & Clemson,

MIDDLETOWN, ORANGE CO., N. Y.

LIVINGSTON'S

PATENT BRACED

WOOD SAWS,

Pat. BUTCHER & KITCHEN SAWS

Recognized Standard Goods for durability, quality and finish.

For sale by the Hardware Trade and

T. F. Cheritree & Co., New York.

We make a specialty of the LARGEST SIZES of **Circular Saws,** and call particular attention of lumber manufacturers to the following points of excellence

EVENNESS OF TEMPER.

The peculiar structure of our furnace subjects all parts of the saw to a DEAD heat, and when dipped in the oil bath secures perfect uniformity.

PERFECT ACCURACY IN THICKNESS.

Our saws are ground on a patent machine, automatic in its operation, grinding off the thick places upon the plate before the thinner parts are reached, and when the saw is removed BALANCES PERFECTLY, which is proof positive of the right accomplishment of the work.

PROPERLY HAMMERED.

Great care is taken that no saw shall leave our works without due attention in this important particular. A saw too tightly strained upon the rim, or too loose in the center, can not be successfully run—hence the importance of so hammering the saw as to effect equal strain in all its parts, and at the same time RUN TRUE. This department is under the personal supervision of our Senior, who has devoted over *twenty years* to the art of saw making.

We are sole proprietors and manufacturers of the celebrated **"Clipper" Cross-Cut Saw.** Price Lists of all kinds of saws sent on application.

OHLEN & LANMAN.
Columbus, O.

Excelsior Saw Works.

515 Cherry St., Philadelphia.

WM. McNIECE,

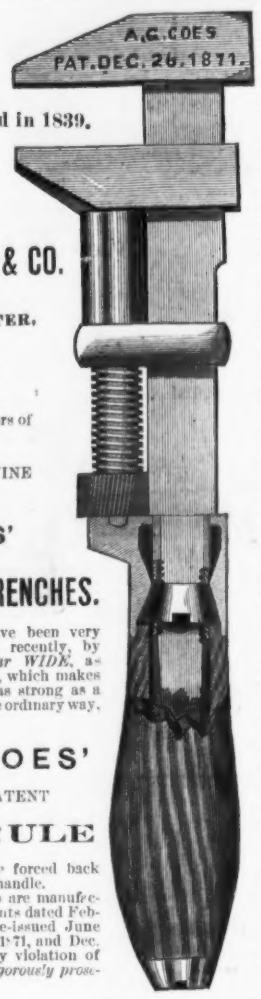
Manufacturer of

Superior Cast Steel Hand, Panel, Ripping, Ice, Compass, Hack, Butchers' Bow, Grafting, Pruning, Keyhole and Web Saws, Mowing Knives, Trunk Springs, And all other kinds of Springs, made from Sheet Cast Steel.

H. Croft's Scientific Concave and Convex Razor Strop

Is perhaps the only Strop manufactured on a strictly scientific principle. By a few passes over the Strop the Razor is enabled to pass through the hardest beard with ease, and is highly recommended by Barbers and all Scientific Men who have used it, and do cheerfully recommend it to be the best Strop that is sold in the market. The attention of dealers is solicited to this Strop, and wholesale men can have, on application, a sample Strop sent free of charge on application to the Patentee at Springfield, Ohio.

Hardware.



Established in 1839.

A. G. COES & CO.

WORCESTER,

Mass.,

Manufacturers of

THE GENUINE

COES'

SCREW WRENCHES.

Our goods have been very much improved recently, by making the *Bar WIDE*, as shown in the cut, which makes a 12 in. Wrench as strong as a 15 in. made in the ordinary way, and by using

A. G. COES'

NEW PATENT

FERRULE

Which cannot be forced back into the handle.

☞Our goods are manufactured under Patents dated February 7, 1860, (re-issued June 29, 1871), May 2, 1871, and Dec. 26, 1871, and any violation of either will be *vigorously prosecuted.*

We call particular attention to our new Patent Ferrule, with its Supporting Nut (shown in section in the above cut), which makes the strongest Ferrule fastening known.

A. G. COES & CO.

VAN WART, SON & CO.

Hardware Commission Merchants,

BIRMINGHAM, - ENGLAND.

AGENTS

VAN WART & McCOY,

43 Chambers Street, New York.

GEORGE H. GRAY & DANFORTH,

48 India Street, Boston.

F. W. TILTON,

17 Old Levee Street, New Orleans.

At each of these places a complete assortment of samples of Hardware and Fancy Goods will be found, including all new descriptions. Sole Agents for the

John Rimmer & Son's Celebrated Harness and other Needles.

OSCAR IRVING VAN WART & Co.,

FORWARDING AGENTS,

2 South John Street, LIVERPOOL.

ALFRED FIELD & CO.,

Foreign Hardware Commission Merchants.

PRINCIPAL OFFICES.

Birmingham, England, Nos. 66 & 67 Parade.

Sheffield, England, No. 23 Westfield Terrace.

New York, U. S., Nos. 47 John and 5 Dutch St.

BRANCH OFFICES.

Philadelphia, Cincinnati, New Orleans and Montreal.

Shipping Office.

Middleton Building, No. 1 Rumford St., Liverpool.

1872.

Review of the Hardware Market for the Year.

[CONTINUED.]

APRIL 4.—The extraordinary advance in Copper has unsettled values of Brass and Copper goods. A week ago the price was 34 cents, but to-day the price is 41 cents. This price is not likely to be maintained for any length of time. The price of Sheet Brass, Wire, Tubing, etc., advanced since our last, 6 cents per lb. Copper Rivets and Burs have also advanced. Brass Cocks are held at list net, formerly discount 10 per cent. Enameled Kettles have advanced to discount 5 per cent., and Sauce Pans, Glue Pots, etc., to net list. Goodlad's Mill Files are now $4·50, gold, to £, and other varieties of this brand $4. Providence Plate Hinges are now discount 10 and 5 per cent. Sad Irons, 5¼ to 6 cents per lb. Polished Steel Shovels and Tongs are discount 15 per cent. We advance quotation of Spear & Jackson's Saws to $4·50 to £, gold. Several American makers have advanced the price of Cross Cuts 5 cents per foot. The manufacturers of Tea Trays have advanced their prices about 7½ per cent. Chatillon's Patent Balances, or Scale Beams, are advanced from discount 33⅓ to discount 20 per cent. The list for Escutcheon Pins is advanced from 10 to 15 per cent. the discount, 20 per cent., being unchanged. E. & T. Fairbanks & Co., on the 1st instant, issued a new price list of their Scales; the discount remains as before. Russell & Erwin Mfg. Co. have revised their price list of Locks. The list is not yet ready for publication, but we expect to be able to give it in our next issue. The Trenton Lock Company have issued a circular, dated 23d ult., in which they say, "On and after this date we will add 20 per cent. to our price list of October 1, 1871, the discount remaining as before, viz., 50 per cent., subject to sight draft thirty days after date of invoice. If paid within thirty days, 2 per cent. extra will be deducted." Joseph Rodgers & Sons have given notice that the following advances will be charged on all orders received in Sheffield after the 1st of March last: 10 per cent. advance at foot of invoice on Scissors and 5 per cent. on other Cutlery. Also the following sterling advances, viz.: 3 per gross on Common Table Cutlery, except Stag; 2d. per pair on Common Carvers, except Stag; 6d. per dozen on Ivory Table and Dessert Knives between the Nos. 2575 and 2596, 2829 and 2838, and 4000 and 4010. These advances to be made on prices ruling up to Oct. 31st last, and they consequently include the advance mentioned by us as taking place on Nov. 1st last. We print the discount sheet for Wrought Iron goods issued by Williams, White & Churchill under date of April 1. H. Burden & Sons advanced their Horse Shoes ⅛ cent per lb. on the 1st instant, making the price 6 cents, and 7 cents for Mule Shoes per lb. for 100 kegs in one order delivered free on board at Troy; the freight to this city is 10 cents per keg. At these prices they are prepared to take orders for all they can deliver in April. To parties who do not sell below cost, the following discounts will be allowed: 500 kegs this year, 2 per cent.; 1000, 3 per cent.; 1500, 4 per cent.; 2000 or over, 5 per cent., payable in January 1873. The Rhode Island Horse Shoe Company also advance prices ½ cent. They allow the same quantity discounts as H. Burden & Sons, but no stipulation in regard to underselling. On the 1st instant the price list of Eagle Anvils was advanced; the discount remaining as before, viz., 15 to 15 and 5 per cent. Lloyd, Supplee & Walton announce by circular, dated 1st instant, that on the 8th they will advance the price on Bonney's Patent Hollow Augers to discount 25 per cent., with the usual extra discount for five dozen lots. They will also advance the price of Bonney's No. 1, 2 and 3 Gate Hinges to discount 20 per cent. The discount on Bonney's Spoke Trimmers will remain for the present at 25 per cent., and Bonney's Double Edge Spoke Shaves, 15 per cent. discount, with the usual extra discount for five dozen lots. They will have on the market on April 8th Bonney's Patent Saw Vise. List, $20 per dozen; discount 25 per cent. Wire advanced on the 1st instant. We print the new discounts. The Francis Axe Co., of Buffalo, have issued their second annual price list of Axes, Hatchets, Picks, Mattocks, etc. The Bricksburgh Mfg. Co. have issued a price list for their new Parallel Vise, the discount from which is 25 and 10 per cent. Nails advanced to-day 50 cents per keg, making the present rates $5·75 per keg for 10d. to 60d.

APRIL 11.—During the past week a great many advances have taken place, and more are looked for. Copper has advanced to the almost unprecedented figure of 45 cents per lb. Brass advanced to-day 6 cents per pound. Tin and Tin Plates are high, and advancing. The Pump makers met in Medina to-day, and voted to advance prices 15 per cent. The price of Board and Box Copper Mills has advanced 5 per cent., making the discount from manufacturers 20 per cent. for common and 15 per cent. for better grades. Patent Toe Calks have advanced to 12½ cents per pound. On 100 boxes a discount of 2½ per cent. is allowed; on 250 boxes, 5 per cent., and on 500 boxes, 7½ per cent. Bonney's Hollow Augers are now discount 25 per cent., and Stearns' discount 30 per cent. Strap and T Hinges, Wrought Butts, and that class of goods advanced yesterday. We publish the revised discount sheet of Stanley Works. Brass Wheel Plate Casters are now discount 10 per cent. Washington Mills Emery is now 7 to 7½ cents for regular numbers, and 4½ to 5 cents for Flour. E. F. Emmet & Co.'s Hammers are discount 20 per cent. American Pressed Horse Nails have advanced 2 cents per lb.; National have advanced 1 cent. per lb. Manila Rope is ⅛ cent. lower, and Sisal 1 cent. lower per lb. The list price on Seymour's Straight Trimmers has been altered. We publish the new list price on Rockwell's Patent Brass Chamber Candlesticks, which is net. On Thursday last, Nails advanced in Pittsburgh to $5·50 rates. Here the price is steady at $5·75 for 10d to 60d. Hart Mfg. Co., Sargent & Co., Peck, Stow & Wilcox Co., and other makers of similar goods, have advanced their prices materially. Ives' Augers, Bits, &c., have been advanced 5 per cent. On the 4th instant a number of makers of Carriage and Tire Bolts advanced their prices to the following figures, cash, in 30 days: Common Carriage and Tire Bolts in lots of $1000, net, and upward, dis. 60 per cent. Less than $1000, and over $500, net, dis. 50 and 15 per cent. Less than $500, net, dis. 50 and 10 per cent. Full Square Carriage Bolts, in lots of $1000, and upward, dis. 50 and 10 per cent. Less than $1000, and over $500, net, dis. 50 and 5 per cent. Less than $500, net, dis. 50 per cent. The Rule Manufacturers, at their meeting to-day, advanced the price of Boxwood and Ivory Rules to discount 25 and 10 per cent. The Nicholson Files have been advanced to the following prices: Mill Files, $5·50; other kinds, $5·25, and Single Cut Tapers, $5 to £, currency.

APRIL 18.—Business is good, and nearly all manufacturers are behind their orders. Wire was advanced yesterday. The manufacturers of Casters are in session to-day, and an advance is likely to be the result of their meeting. Brass Cocks have advanced to add 10 per cent. Yerkes and Plumb's Hammers have advanced to discount 5 to 10 per cent. Broughton's and Common Oilers have advanced to discount 20 per cent. Taft's Pattern Wrenches are now discount 60 and 15 per cent. Russell & Erwin Mfg. Co., under date of April 12th, issue a revised discount sheet for their "Real Compression Bronze Hardware." The following prices were adopted by the Pump Manufacturers at their meeting on the 10th instant: Iron and Brass Cistern and Pitcher Spout Pumps, discount 20 per cent.; Well and Set Length and Drive Well Pumps, Iron Force Pumps, Hydraulic Rams and Garden Engines, discount 15 per cent. On positive out and out orders for delivery in 60 days from date of order for $250 or more, net amount of invoice of Pumps, Rams and Garden Engines, the discount shall be 5 per cent. more, and shall apply in all subsequent purchases to January 1, 1873. On purchases of $500 or more at one time, of above mentioned goods, there will be an extra discount of 10 per cent. instead of 5 per cent., and the same discount shall apply on subsequent purchases to January 1, 1873. The Taylor Manufacturing Company, under date of April 8, issue a new list of prices for their goods. Henry Burden & Sons and the Rhode Island Horse Shoe Co. have advanced Horse Shoes ¼ cent per lb. The makers of Stamped, Plain and Retinned Ware have advanced their prices 5 to 10 per cent., the present discount being 15 per cent. Tinned Iron Threaded Spoons were advanced yesterday, the discount remaining as before. The Ausable Horse Nail Co. have advanced their prices one cent per lb. The following are their quantity discounts: 1000 lbs., 5 per cent.; 5000 lbs., 7½ per cent.; 10,000 lbs., 10 per cent. The price of Clinton Nails is also advanced one cent per lb. The New London Horse Nails have been advanced one cent per lb. on both the "Great Western" and "U. B." brands; they are subject to a discount of 5 per cent. on 1000 lb. lots. The manufacturers of Surface Window Blind Hinges, known as "Parker's," "Clark's," "Seymour's," and "Shepard's," advance their prices as follows, taking effect on the 15th instant: Regular discount 25 per cent. For an order of 50 cases at one time, discount 30 per cent. Spear & Jackson have changed their prices to the following: Spear & Jackson Saws, $4·50 per £, gold. John Spear Saws, $4 per £, gold. Files, $5·50 per £, gold. Chisels, Gouges, Plane Irons, and other tools, $5·50 per £, gold. Newman & Capron have advanced their Castings to 56 cents per lb. Their present price for Speaking Tube is: 1 inch, 3 cents per foot; 1¼ inch, 4 cents per foot. Elbows, 4 cents each; Bell Tube, 18 cents per lb. Discount on 1000 feet Speaking Tube, or 500 lbs. Bell Tubes, 10 per cent.

APRIL 25.—A good trade is doing, but not so large as a few weeks ago. The large buyers are now giving place to a smaller class. The price of metals is well maintained and a considerable advance is anticipated in cast steel. Mallory, Wheeler & Co. have advanced their Door Locks, Knobs, Escutcheons, and other goods, except Padlocks, which remain as before, to discount 45 and 2 per cent. for cash. Sargent & Co.'s No. 1 Screw Drivers are now discount 10 per cent. cash. The manufacturers' price of Stocks and Dies was advanced on the 22nd, from 30 to 25 per cent. discount. We quote them in this city, discount 20 to 20 and 5 per cent. Charles Parker's Vises will be advanced about 10 per cent. English goods of all kinds are scarce. A further advance is announced by cable on Peter Wright's Anvils, the price being 31/ per cwt. The market for English Coil Chain is stiff. Luther Boardman & Son, under date of 20th instant, issue a revised discount sheet for their Spoons and Forks. They say, "these quotations are given for seven days only, so long as our stock on hand can be furnished at the present current rates of metals, &c." Landers, Frary & Clark have adopted a new list of prices on Bright Wire Goods, which we publish, from which they will take a discount of 50 and 10 per cent. net cash. Buck Brothers have advanced the price of their Socket Firmer Chisels to add 20 to 25 per cent. on their price list of 1871, being 5 to 10 per cent. on previous rates. On Socket Framing Chisels they discount 15 to 17½ per cent. Their Shank goods they hold at 20 to 25 per cent. advance on their list, being equivalent to $5·50 to $5·75 to the £, gold. The price of Cast Butts was advanced on the 20th instant. The meeting of the manufacturers of Casters mentioned last week was without result.

MAY 2.—A good many buyers are in town and orders by mail are satisfactory. The uniform tendency is still upward, and we do not think we have yet reached the end of this movement. Metals are held at very high prices. The foreign markets are firm. The makers of the Lightning, Turn Table, Reading and Conqueror Apple Parers have agreed that the price for this season shall be $9 per dozen; in lots of 50 dozen or more, $8 per dozen. Brundage Horse Nails were advanced on the 1st instant. Terms, for orders of 500 lbs. in one order, discount 5 per cent.; 2000 lbs., 7½ per cent. The Ausable Horse Nails were advanced same time. The following are the quantity discounts: 1000 lbs., 5 per cent.; 5000 lbs., 8½ per cent.; 10,000 lbs., 10 per cent. The makers of Gunpowder have advanced their list prices from 5 to 10 per cent., and reduced the discount from 10 to 5 per cent. Yaw's Cow Bells are now held at list net. Galvanized Telegraph Wire has been advanced to 9¼ cents per lb. for No. 9, 10 cents for Nos. 10 and 11, and 11 cents for No. 12. Bradley & Hubbard's Bells are now discount 15 per cent., instead of 25 per cent. Newbould's Files, Chisels and Plane Irons, &c., are quoted $5·50 to £, gold. Burden's circular, for May 1st, makes no change in the price of Horse or Mule Shoes, which remain, respectively, 6¼ and 7¼ cents per lb. at Troy. The Rhode Island Horse Shoe Company, however, advanced their prices ¼ cent per lb. Freight from Troy or Providence to New York is 10 cents per keg, and from Providence to Boston, 7½ cents. Russell & Erwin Mfg. Co. made to-day a new list on Hale's Patent Meat Cutter and Stuffer, the discount remaining 10 per cent. They have also adopted net prices on Waterman's Patent Cast Iron Bake Pans, the patent on which they own. Humason & Beckley Mfg. Co. and Hotchkiss Sons have to-day advanced the price of Steel and Copper Bull Rings to discount 10 and 10 per cent.; lots of 12 doz., discount 10, 10 and 5 per cent. Hotchkiss Sons have also advanced Bow Pins to discount 15 and 10 per cent.; by the case of 6 gross, discount 15, 10 and 5 per cent. Game Traps, discount 20 per cent.; 100 dozen lots, discount 20 and 10 per cent. Baeder, Adamson & Co., on the 1st instant, advanced their Flint and "Star" Paper 25 cents per ream, Emery remaining unchanged. The Members of the American Cutlers' Association have advanced their list prices about 10 per cent., discounts and terms unchanged. Wrought Iron Goods have advanced; the new discount sheet, which we publish, was issued to-day.

MAY 9.—There are not many buyers in town, but better orders are coming in pretty well. Manufacturers and jobbers are still busy on back orders. So far this season the business has been very large, and we believe the sales for last month will foot up far beyond those of any previous April. The Providence Horse Shoe Company have advanced the price of their Patent Steel Toe Calks half a cent per pound. Hotchkiss' and Kellogg's Curry Combs have been advanced to discount 10 per cent.; 5 barrel lots, discount 10 and 5 per cent.; and 10 barrel lots, discount 10 and 10 per cent. We quote Hoes and Rakes discount 25 to 30 per cent.; Sash Weights 3 ⅛ to 3¾ cents per lb. Coe's Wrenches have advanced to discount 30 per cent.; in 30 dozen lots, discount 35 per cent. A large lot of Chain has arrived this week, but prices will be fully maintained, as advanced prices have been paid. Leading English Files are in exceedingly short stock. The list quotation for Wade & Butcher's Razors is $8, and Wostenholm's $9 to £, gold. In England, Pearl and Ivory are now double the price of six months ago, and all Pearl, Shell and Ivory Pocket Cutlery has advanced 10 per cent. for common grades and 15 per cent. for finer goods. Grain and Grass Sickles have advanced 10 per cent. Landers, Frary & Clark have advanced the list of No. 180 Scale to $7 each, and made Tea, Hatch and Union Scales net list. They have also adopted a revised list on Brass Wire Goods, from which they take a discount of 50 and 10 per cent. cash. The manufacturers of Spring Balances to-day adopted a revised list, which we print, the discount from which is 15 per cent. Parties whose net purchases from January 1st to July 1st, or from July 1st to January 1st, amount to $300, will be entitled to a further discount of 7½ per cent. Nails are steady without change at $5·75 rates.

MAY 16.—There is a falling off in the amount of new orders, and it is generally admitted that the spring business is coming to a close. Trade in all parts of the country is in a good condition; collections are prompt as usual. We notice a further advance of 5 per cent. on Joseph Rodgers & Sons Ivory Table Cutlery, making the advance at foot of invoice 10 per cent., instead of 5 per cent. as heretofore. Cable advices report a further advance in English Coil Chain. On the 10th instant Washburn & Moen Mfg. Co. advanced the prices of Nos. 8 and 9 Galvanized Telegraph Wire to 9½ cents per lb., net. Nos. 10 and 11 remain as before. Annealed Fence and Grape Wires are now discount 15 to 20 per cent.

MAY 23.—The general tone of the Hardware market presents little difference from last week. We have taken some pains to obtain information regarding the English File trade, but until the 1st proximo, when the new list will be issued, it is impossible to say anything definite. This, however, is known, that a new scale of prices has been agreed upon and an advance varying from 5 to 15 per cent. may be anticipated. Orders for Files are received, subject to the new conditions. The Russell & Erwin Mfg. Co. have just received a line of Jowitt's Files, which they hold at $5·50, gold. The manufacturers of Dodge's Genuine Kentucky Cow Bells have advanced their list from 5 to 15 per cent., making a new and uniform list, which was before very irregular. We publish the new list, from which a discount of 25 per cent. is made. Star Faucets have been advanced from dis. 60 to 57½ per cent. Under date of May 20th, the manufacturers of Harness Snaps issued an advanced price list for their goods, the discount from which is 30 per cent. net cash.

MAY 30.—The past week has presented few changes worthy of note in the Hardware trade. Sheet Brass has not, up to the present writing, declined in sympathy with Copper. Henry Seymour & Co. give notice that all orders received on and after June 1st will be filled at discount 45 instead of 50 per cent. as heretofore. Oliver Ames & Sons' Shovels are now quoted at discount 2½ per cent. instead of 5 per cent. formerly. We publish this week the new standard File list, which is calculated from the English list at the rate of $5 to the £ sterling, and we also publish the sterling list for such Files as are in general demand. Nails are steady at $5·75 rates.

JUNE 6.—Trade very quiet. Interest centered on the new Sheffield file list, a correct copy of which we publish. We quote Butcher's Files $5·50; Goodlad's, $4; J. & Riley Carr's, $5·25; Moss & Gambles', $5 to $5·50; Spear & Jackson's, $5·50; Jowitt's, $5; W. K. & C. Peace's "Imperial," $5·25; R. Ibbotson's, $5 to £, all gold, new list; Hargreaves, Smith & Co.'s $5 to $5·25, and Beam & Murray's "Cyclops," $5 to £, gold, old list. Of American manufacturers, J. & W. Rothery were the first reported as having adopted the new list, making their figure $6 to £. Under date of 1st inst., D. Maydole & Co. issued a new list, which we publish, together with their terms, which are as follows: "From this date we shall sell exclusively for cash, and shall draw at sight for all bills not settled within 30 days from date. Orders amounting to less than $100 (except to parties whose purchases amount to one thousand dollars per annum), will be net cash, at list prices. On orders amounting to $100 or over, a discount of 5 per cent. will be allowed, and the freight actually paid, but in no case to exceed two per cent. Orders will be executed in the order of receipt, and goods will always be invoiced at the prices ruling at the time of shipment." Butcher's Light Tools are now held at $5·25, and Heavy at $6·25, gold, to £. A new list is expected in July. The K. F. M. Fluting Machine is now $5·50 for 4½ inch, and $6 for 6 inch. Star brand Horse Nails are now 16 instead of 14 cents per lb. The John Spear Saw is now $3·60 to £, gold. Shears have been advanced to discount 60 and 7½ to 65 per cent. Rope has been advanced half a cent. Joseph Rodgers & Sons' Spring Cutlery, Razors, Scissors, and Common Table Cutlery, advanced 5 per cent., making the ruling rates: 15 per cent. advance on Scissors, and 10 per cent. on all other Cutlery. Nails are steady at $5·75 rates. Garretson's & Taylor's Mop Sticks have advanced about 5 per cent. Leach's Saw Sets have advanced to $8 for No. 0 and $15 for No. 1. They are sold by jobbers here at from net to discount 5 per cent. Hartzell, Potter & Co. have furnished us with advance sheets of their new price list for Axe, Pick and Hammer Handles, &c., which we publish.

JUNE 13.—There is a good deal doing, both in the way of new orders and filling balances on old ones. The price of Iron seems likely to be fully maintained, if not increased, and in the present state of the labor market there seems little chance of any reduction in the price of American Hardware. The position of Foreign Hardware is just as strong. The importers of German Chain have this day adopted a new list, which we publish, the discount from which is 10 per cent. On the 8th inst., P. & F. Corbin, Russell & Erwin Mfg. Co., Norwalk Lock Co., Branford Lock Co., Parker & Whipple, and Nashua Lock Co., adopted uniform list prices for Locks, from which they take a discount of 25 per cent. We print the list of the Russell & Erwin Manufacturing Co. A cable despatch to Alfred Field & Co. announces an advance of 1/ on Peter Wright's Anvils, making the price now 32 per cwt. Butchers' Tools are now $5·50, gold, to £. Galvanized Telegraph Wire, Nos. 11 and 12, is now 10½ to 11 cents per pound. The American File Makers will hold a meeting to-morrow to take action in regard to the basis for lists, both of selling and wages. Hargreaves, Smith & Co.'s Files are now held at $4·75 to $5 to £, gold, new list. Gaynor, Emmet & Co. quote their Hammers, Sledges, and Steel Goods discount 15 per cent. instead of 20 per cent. formerly. We quote B. F. Badger's Genuine Emerson Razor Straps discount 45 and 5 per cent. We print the reduced list of Copper Rivets and Burs. Old Colony Shovels and Spades have advanced to discount 3½ per cent. The Enterprise Mfg. Co. have introduced two new styles of their Champion Mills with Brass Hopper, and handsomely finished, No. 1 (4½ feet high, weighing 120 lbs.), to stand on floor, price $35, and No. 2, to stand on the counter, price $25, less discount 20 per cent. Barton, Alexander & Waller have removed from No. 68 Beekman street to the first loft of Hermann Boker & Co.'s building on Duane street.

JUNE 20.—Trade is dull, though it is generally conceded that manufacturers are better supplied with orders than they have been at this season during any of the years since the close of the war. The Association of the Bolt and Nut Manufacturers of the United States, at their meeting on the 12th instant, made some important changes in their list of Machine Bolts, Lag Screws, Set Screws and Tap Bolts, Bolt Ends and Turn Buckles. Carriage Bolts were unchanged. That portion of the list which was revised we printed in full. Blacksmiths' and Moulders' Bellows have advanced to discount 10 to 15 per cent., formerly 15 to 20 per cent. A meeting of the Vise and Tool Association will be held at Philadelphia on the 24th instant. At a meeting of the American File Manufacturers, held on the 13th instant, it was unanimously resolved that the new English price list for Files and Rasps, of May 17, 1872, to which the seal of the Cutlers' Co. is attached, be, and is hereby, adopted at $5 to the £ by the undersigned from this date, and shall be known as the American File List. The resolution was signed by twelve large manufacturers. Nails are steady at unchanged rates, viz., $5·75.

JUNE 27th.—Taking into consideration the near approach of the dull season, the amount of business transacted is greater than is usual at this time. There are few changes to note. Emery has advanced 1 cent per pound. A recent cable dispatch announces an advance of 2 in Coil Chain, ⅜ being now quoted at 25 sterling. Trace Chains have also advanced, but the new price has not yet taken effect here. The meeting of the Vise and Tool Association is still in session, but their action is not yet made public. The American Cutlery Association held a meeting on the 25th instant, at which no business of importance was transacted; they adjourned to meet again in a few days. It is proposed to advance only such goods as are too low in proportion to the body of the list. Joseph Rodgers & Son's Cutlery is in good demand, but owing to continued trouble with the workmen, orders for importation are only taken at prices ruling at time of shipment. A further advance in Pearl goods may be expected. In German hardware there is little or nothing doing. The importers here have cancelled their orders in the hope that this course will have some effect in bringing the workmen to their senses. Most of the large manufacturers in that country have locked out their workmen, rather than yield to their exorbitant demands. The Trenton Lock Co. have issued a new list, which we publish, conforming their prices to the uniform list adopted at the meeting of the Lock manufacturers June 8th, the discount from which is 25 per cent. The Stove manufacturers issued a circular, dated 19th instant, informing the trade that on and after July 1st the price of Stoves will be advanced 5 per cent. Present discount 10 per cent.; after July 1st, 5 per cent.

[To be continued.]

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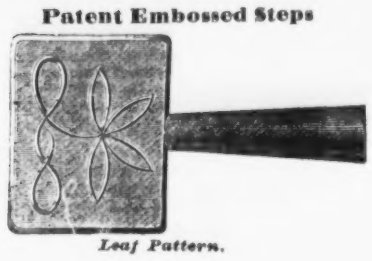
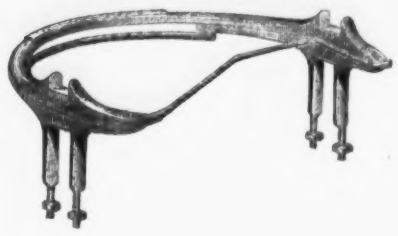
Patent Embossed Steps



Leaf Pattern.

King Bolt Yokes.

No. 6 Fifth Wheels.

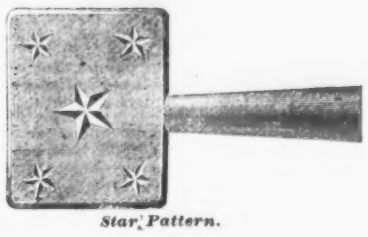


1871 Pattern Shaft Couplings.

Patent Cross Bar Steps.

Upper View.

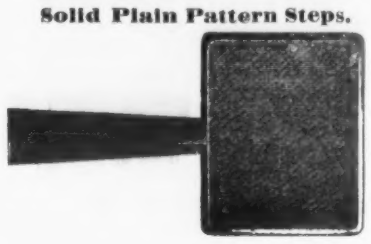
Lower View.



Star Pattern.

Smith's Improved Philadelphia Pattern Slat Irons.

Solid Plain Pattern Steps.



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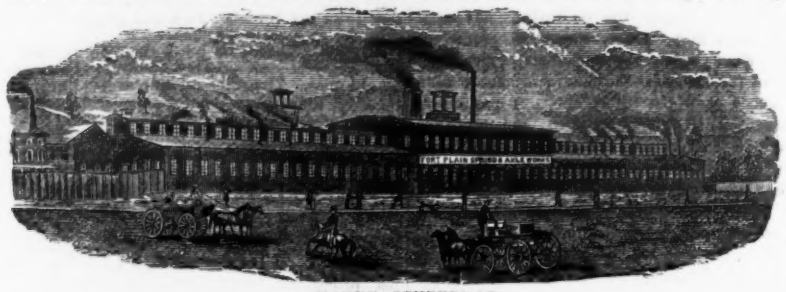

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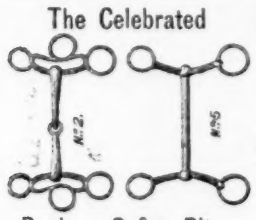

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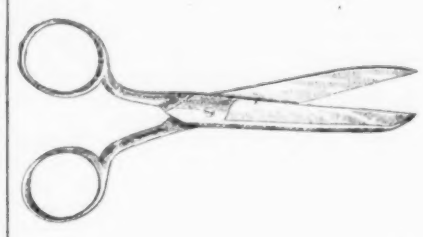

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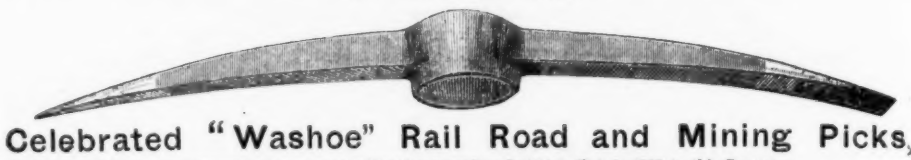

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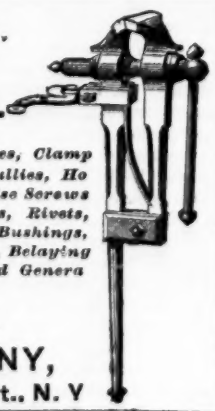

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Rumsey & Co., Seneca Falls, N. Y....15
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Valley Mch. Co., Easthampton, Mass....15

***Rails,** Importers of.*
Congreve Chas. & Son, 104 and 106 John, N. Y...28
Hopkins S. W. & Co., 57 Broadway, N. Y....4
Naylor & Co., 99 John, N. Y....4
Smith Gilead A. & Co., 62 Broadway, N. Y....4

***Rails, Iron or Steel,** Makers of.*
Atkins Bros., Pottsville, Pa....6
Cambria Iron Co., Johnstown, Pa....6
Cleveland Rolling Mill Co., Cleveland, O....6
Griswold John A. & Co., Troy, N. Y....29
Springfield Iron Co., Springfield, Ills....6
Joliet Iron & Steel Co., Joliet, Ills....6

***Razor Straps,** Makers of.*
B. F. Badger, 51 Elm, Charlestown, Mass....26
Croft H., Springfield, O....10

***Rolling Mill Machinery, &c.,** Manufacturers of.*
Moore James, Cor. 16th & Buttonwood, Phila....30

***Rolls, Chilled and Sand,** Makers of.*
Garrison A. & Co., Pittsburgh, Pa....4

***Saddlery Hardware,** Makers of.*
Pratt & Letchworth, Buffalo, N. Y....12

***Sash Balances,** Makers of.*
Anderson Balance Mfg. Co., Pittsburgh....21

***Sash Locks,** Makers of.*
Clark & Co., Buffalo, N. Y....22

***Saws,** Makers of.*
American Saw Co., 1 Ferry, N. Y....10
Cheritree T. F. & Co, N. Y....10
Boynton E. M., 80 Beekman, N. Y....10
McNeice Wm., 515 Cherry, Phila....10
Ohlen & Lanman, Columbus, O....10
Peace Harvey W., Williamsburg, N. Y....10
Spear & Jackson, 98 Chambers, N. Y....22
Wheeler, Maiden & Clemson, Middletown N.Y....10

***Saw Frames, Wood,** Makers of.*
Peace Harvey W., Williamsburg, N. Y....10

***Scales,** Manufacturers of.*
National Scale Co., 203 River, Troy....32
Riehle Bros., 9th near Coates, Phila....32
Shattuck W. F. & Co., 113 Chambers, N. Y....14

***Scissors,** Manufacturers of.*
U. S. Steel Shear Co., W. Meriden, Ct....12

***Screws,** Makers of.*
Miles F. S., 208 Quarry, Phila....22

***Silks,** Makers of.*
Cheney Bros., Hartford, Conn....12

Smelting Works.
Du Plaine & Reeves, 780 S. Broad, Phila....15

***Stamped Tin Ware,** Makers of*
Farrington J. D., Jr., 26 Murray, N. Y....8

***Steam Hammers, etc.,** Makers of.*
Dudgeon Richard, 24 Columbia, N. Y....31
Ferris & Miles, 34th and Wood, Phila....31

***Stone Tools,** Manufacturers of.*
H. M. Chase, Worcester, Mass....9
H. H. Harvey & Co., Augusta, Me....9

***Snaps, Harness,** Makers of.*
Middletown Tool Co., Middletown, Conn....22

***Spool Lifters,** Makers of.*
Chapin Machine Co., New Hartford, Conn....31

***Sporting Goods,** Dealers in.*
Barton, Alexander & Waller, 101 Duane, N. Y....2

***Squares, Steel and Iron** Makers of.*
Hart, Bliven & Mead Mfg. Co., 243 Pearl, N. Y...26

***Stationers' Hardware,** Makers of.*
Stephens C. B., Plainville, Conn....21

***Steam Pumps, etc.,** Manufacturers of.*
Woodward Steam Pump Co., 76 Centre, N. Y....15

***Steam Traps,** Manufacturers of.*
Fullerton & Hollingshead, Camden, N. J....31

Steel Importers.
Carr J. & Riley, 82 John, N. Y....28
Cocker Bros., Sheffield, Eng....28
Congreve Chas. & Son, 104 and 106 John. N. Y...28
Hobson Francis & Son, 97 John, N. Y....28
Jessop Wm. & Sons, 91 and 98 John, N. Y....28
Moss F. W., 80 John, N. Y....28
Piersons & Co., 94 Broadway, N. Y....4
Sanderson Bros. & Co., 16 Cliff, N. Y....28
Sanderson Geo. & Co., 96 John, N. Y....28
Van Wart & McCoy, 43 Chambers, N. Y....28
Wardlow S. & C., 18 Gold, N. Y....28
W. Hawksworth, Ellison & Co., 72 John, N. Y....28

Steel Manufacturers.
Anderson & Woods, Pittsburgh....29
Chrome Steel Co., Brooklyn, E. D....29
Cleveland Rolling Mill Co., Cleveland, O....6
Griswold John A. & Co., Troy, N. Y....29
Hussey, Wells & Co. Pittsburgh....29
Miller, Barr & Parkin, Pittsburgh....28
New Jersey Steel and Iron Co., Trenton, N. J....29
Reese, Graff & Co., Pittsburgh....29
Rowland Wm. & Harvey, 948 Beach, Phila....32
Singer, Nimick & Co., Pittsburgh....28

***Stove Boards,** Manufacturers of.*
Shepard Sidney & Co., Buffalo, N. Y....31

***Stove Polish,** Makers of.*
Joseph Dixon Crucible Co., Jersey City, N. J....32
"Gem" Stove Polish, 172 Forsyth, N. Y....

***Twist Drills,** Makers of.*
Morse Twist Drill & M. Co., N. Bedford, Mass....30

***Tackle Blocks,** Makers of.*
Burr & Co. 31 Peck Slip, N. Y....8

***Tin Ware,** Manufacturers of.*
Shepard Sidney & Co., Buffalo, N. Y....26

Tacks.
American Tack Co., 117 Chambers, N. Y....15
Grundy Geo. C., 12 Platt, N. Y....15
Dunbar, Hobart & Whidden, S. Abington, Mass..15
Field A. & Sons, Taunton, Mass....15
Loring Samuel, Plymouth, Mass....15

***Tags, Waterproof,** Makers of.*
Schencks, 55 Beekman, N. Y....6

***Tea Trays,** Importers of.*
Dickinson Henry, 66 and 68 Reade, N. Y....10

***Tinmen's Tools and Machines,** Makers of.*
Brombacher Charles, Tarrytown, N. Y....25
Peck, Stow & Wilcox Co., 97 Chambers, N. Y...22

***Turbine Water Wheels,** Manufacturers of.*
Capron Water Wheel Co., Hudson, N. Y....25
Ellis & Bonney, New Bedford, Mass....25
Swain Turbine Co., Lowell, Mass....25
Whitehill, Smith & Co., Newburg, N. Y....25

***Tubes, Wrought and Galvanized,** Manufacturers of.*
Griffith I. J. & Bros., Philadelphia, Pa....26

Vises.
Backus Vise Co., 78 Beekman, N. Y....21
Fisher & Norris, Trenton, N. J....21
Howard Iron Works, Buffalo, N. Y....21
Wilson Mfg. Co., 37 Chambers, N. Y....12

***White Lead,** Manufacturers of.*
Brooklyn White Lead Co., 89 Maiden L., N. Y...25
Colgate Robert & Co., 287 Pearl, N. Y....25
Cornell Lead Co., Buffalo, N. Y....25
Jewett John & Sons, 182 Front, N. Y....25
Lewis John T. & Bros., 231 S. Front, Phila., Pa..25
Union White Lead Co., 26 Burling Slip, N. Y....25

***Wire,** Manufacturers of.*
Gilbert, Bennett & Co., 273 Pearl, N. Y....2
New Haven Wire Co., New Haven, Conn....4
Philadelphia Wire Works, N. 5th, Phila....2
Townsend W. P. & Co., Pittsburgh, Pa....2
Washburn & Moen Mfg Co., Worcester Mass....2

***Wire Goods,** Manufacturers of.*
Corning Jasper E., 58 Cliff, N. Y....2
Gilbert, Bennett & Co., 273 Pearl, N. Y....2
Howard & Morse, 45 Fulton, N. Y....2
Parker Samuel, Hartford, Conn....2

***Wire Rope,** Iron and Steel, Makers of.*
Roebling's John A. Sons, Trenton, N. J....2

***Wooden Ornamental,** Makers of.*
Ornamental Wood Co., Bridgeport, Conn....10

***Wrenches,** Manufacturers of.*
Coes A. G. & Co., Worcester, Mass....11

***Wrought Iron Goods,** Maker of.*
Auer John & Co., 203 N. 5th, Brooklyn, E. D....4
Maguire Jas. T., 115 Chambers, N. Y....4

***Wire,** Importers of.*
Field Alfred & Co., 47 John, N. Y....2

American Leather Belting.—The *Shoe and Leather Reporter*, in an article on the superiority of American leather belts, says: We think we are not over-stating the case in saying that in neither France nor Germany do they know how to make, nor do they make, any very large proportion of first-class belting leather or sole leather; in England, where the tanners, as a rule, have well earned their reputation of making the best sole leather in the world, the tannage is generally too plump and hard for the best belt leather; for, while we believe it is hardly possible to put too much tannin into leather to be used for soles, we think it is clear that, when the hide has more tannin than necessary to make it of its original thickness as taken off, its tensile strength is thereby diminished. For belts we want tensile strength and pliability; for soles we do not so much need pliability as the compactness which will resist water and the toughness which will bear a great deal of attrition. The English tanners are eminently successful in obtaining these latter qualities. The difference, however, is not very plainly marked between good belt leather and good sole leather, except that the former requires much better selection of the parts of the hide to be used, and for large belts only the best parts of whole hides can be used. In France and Germany, however, although their calf-skins and upper-leathers are superior to those made anywhere else, their sole leather tanning is equally inferior, is done in a very tedious and slovenly way, and their tanners are at least a hundred years behind the age.

The new iron revenue cutter, building at the Chester Iron Works, is rapidly approaching completion. She is of a fine model and is expected to show good speed. Length, 100 ft.; beam, 20 ft.; and hold, 9 ft. She is built of iron, in the usual manner, inside and outside strakes, and measures 147 tons, O. M. Her draft of water, when loaded, is 8 ft. Her keel is of iron, 2 by 5 in.; stem, 2 by 5 in.; scarfs, 18 in.; stern post, 2¼ by 5 in.; rudder post, 2½ by 3 in., round, and fitted with shoe; frames, 2½ by 2½ by 5-16 in., spaced 20 in. apart; reverse frames, 2¼ by 2¼ by ¼, fitted on each frame and connected to beams. Her floor plates are 5-16 in. thick and 16 in. deep. She has a middle line intercostal keelson, 5-16 by 19 in. Bilge and side keelsons of two angle irons, back to back, 3 in. by 3 in. by ⅜ in.; deck beams, 3 by 4 by ⅝ in., with gusset knees. She has three breasthooks and four bulkheads. Her garboards are 6-16 in., as are also her sheer plates. Her other plating is a little lighter. Her deck stringers are 10 in. by ¼ in. She is cemented up to her bilges on the inside, preventing her rivet heads from wearing away. Her rudder is of 3-16 in. plate, filled in with white pine. Decks of pine. She has a deck house and wheel house fore and aft, after the usual pattern. Her engines are compound, and fitted with a condenser with 560 ft. surface. The propeller is what is known as Cathcart's, and can be turned sideways at will, making it do the work of propeller and rudder at the same time. It is of cast iron, 8 ft. diameter, has 4 blades, and a varying pitch of 13 to 15 ft. She will have one boiler 14 ft. long, 8·6 ft. high, and 7·6 ft. wide. She is No. 59 on the builder's list.

Alongside the above steamer is a wooden one in frame. She is for New York parties, and will be fitted like most tugs, only her wooden framing will be of a superior kind. Her length is 82 ft., 18 ft. beam, 8 ft. hold, and of fine model. Her engine is of the usual type, 22 by 22 inches, with a boiler 13 ft. long. She is No. 61 on the list of Weidner's yard. Another tug is also contracted for, to be 90 ft. long, 19 ft. beam, and 8½ ft. hold, with engine 24 by 24 in. Beside these vessels the Chester Iron Works have in hand a number of boilers and other land work, and a large force of men employed.

It is expected that twelve new iron furnaces, producing 120 tons per day, and affording employment for 1000 workmen, will be in operation at Rome, Georgia, within six months.

The extraordinary demand for iron and coal is causing the development of new sources of supply in Europe. England now draws on Spain and Ireland for iron ore, while new coal mines have been opened in the latter country.

Russia boasts of an immense establishment, rivaling in magnitude the finest workshops of England or the United States. It is near the city of Kolom, employs 4000 workmen, and makes, principally, locomotives, railroads and iron bridges.

It is stated by M. Tatro, the inventor of a process for the purification of petroleum, that by adding sulphuric acid (from 2 to 4 per cent.), and 4 per cent. of dry lime, agitating the oil with it and distilling, a larger proportion of burning oil is produced.

A gratifying announcement connected with the industrial development of West Virginia is that an iron furnace is to be built at Wheeling, where all the conditions are favorable to its success.

Atmospheric gas machines, invented in Germany and improved in England, are coming into use in Bradford, Eng., where they are valued as a convenient and economical small motive power.

Fuel is increasing in price in Paris, as river navigation is entirely suspended, and such banks of mud have been formed that it is feared it will take time to reopen the channels.

The peat deposits of Italy cover an area of about 100,000 acres. She pays $8,000,000 annually to other nations for fuel, and is now endeavoring to economise by using compressed peat.

The boiler in the Rhode Island Stove Works, at Pawtucket, exploded a few days ago, the fragments going out through the roof and falling into a wooden building on the opposite side of the railroad. Although all hands were at work, no one was seriously hurt.

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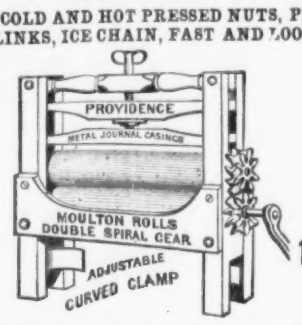

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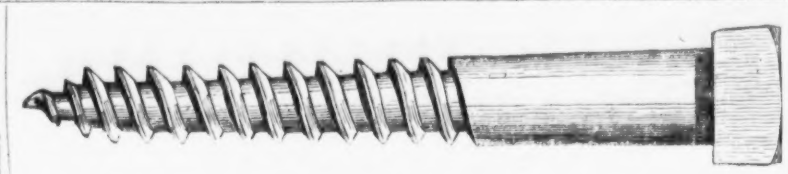

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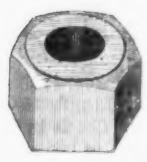

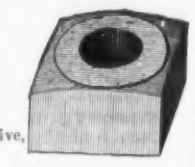

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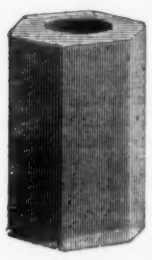

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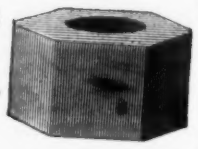

In the Patent Rolled Nut the iron is not cut away or punched aside to form the hole, but is rolled over a rod by heavy iron rollers. This process refines the metal. Its fibers are not torn and shocked. It is cut without injury to the tap. The even surface and the general finish of the Nut commend it to machinists.

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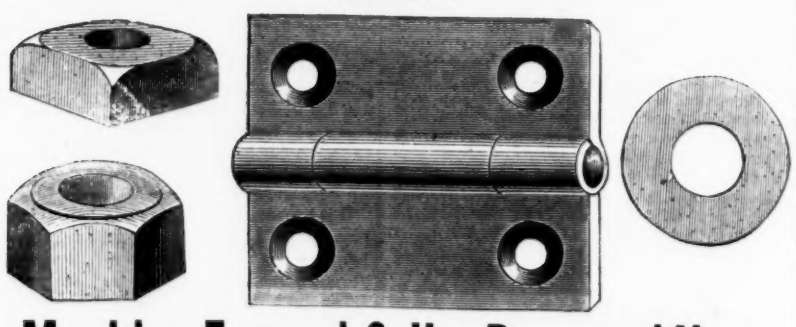

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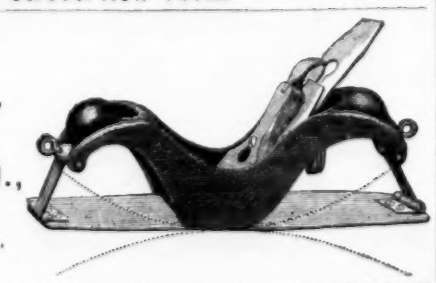

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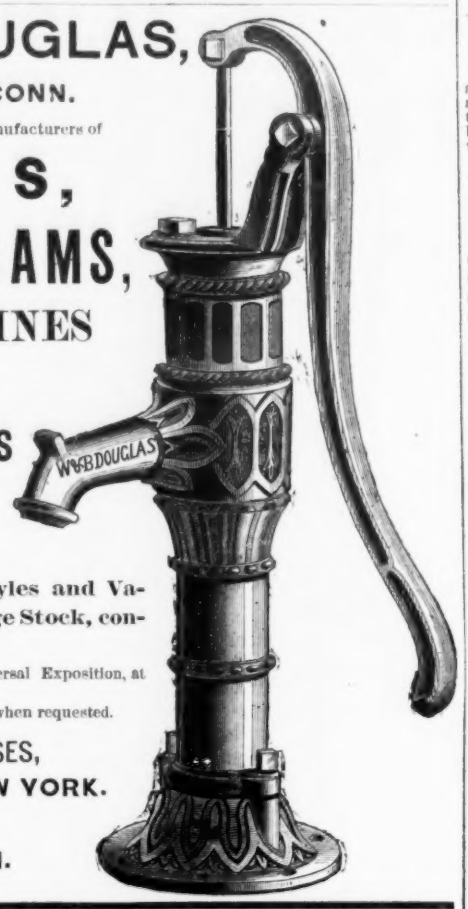

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By a gentleman of 25 years' experience, a position as a Mill and Forge Manager. Have had 4 mills to superintend: merchant mill, 18 inch train, rails, steel, heads and plating bars for edge tools manufacture, and all other kinds of merchant iron; a boiler plate mill and sheets; guide iron of all descriptions, hoop and strips. Have had a great experience in the manufacture of steel, iron for springs, and melting steel for cast steel. Was in last situation 5 years. Undeniable reference for 30 years will be produced. Address A, 152, Ansonia P. O., Conn.

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The advertiser, who has had a long experience with a prominent firm, who, since the fire, have decided to discontinue their Retal Business, desires to make arrangements to represent a good house in Boston, and work the New England States, &c. Address *AGENT, Box 1628 P. O., Boston.*

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In retail Hardware Store in this city; young man (speaking German preferred); must have experience, good salesman, not afraid of any work. Salary moderate but permanent. Address "A. B. C.," Office of *The Iron Age*, 80 Beekman St., N. Y.

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Of superior quality,

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NOTICE.—THE FIRM OF WILLIAM & HARVEY ROWLAND, Manufacturers of Springs and Steel, will be continued as heretofore, the heirs of WM. ROWLAND representing the interest of Wm. Rowland, deceased, as provided for by articles of agreement made January 1, 1868, providing that in case of death of either of the partners prior to January 1, 1878, the copartnership should continue for ten years from the first day of January, 1868, with a further provision for its extension for one year, namely, January 1, 1879.

The interest subsequently given to EDWARD ROWLAND, son of William Rowland, and to WILLIAM ROWLAND, son of Harvey Rowland, will remain as heretofore. HARVEY ROWLAND, Surviving Partner, No. 948 Beach Street, Philadelphia.

December 27 1872.

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For Sale, &c.

Hardware Business For Sale,

At Quincy, Illinois.

The continued increasing demand for our

PATENT AUTOMATIC STEAM GOVERNOR,

Requiring our undivided time and attention to the prosecution of its manufacture, we hereby offer for sale our entire stock of Hardware, together with lease, fixtures and good will. This business was founded at its present location in 1844, by Messrs. L. & C. H. Bull, now prominent bankers in this city, and has since been successfully carried on by themselves and successors in both Wholesale and Retail Branches. Parties desiring a safe and permanent business in a growing and prosperous locality will find this an excellent opportunity to establish themselves upon easy terms, and from such we invite a thorough investigation. Address

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For Sale or to Lease, with privilege to buy, situated at Peekskill N. Y., the Foundry, Machine Shops and other buildings, with water front on the Hudson River, powerful steam engine, and other machinery entirely new, the premises comprising over two acres, and suited for a large manufacturing business. Address **"Manufacturer,"** Office of *The Iron Age*, 80 Beekman St., N. Y.

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BOSTON, Nov., 20, 1872.

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The *"CALVERT ROLLING MILLS,"* situated in the city of Baltimore, were withdrawn from the sale advertised on the 16th of May, and are now offered at private sale, or will be leased to responsible parties. The terms will be made advantageous. The Mills are in perfect order, and can be put in operation at short notice.

For full information address

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Brick Buildings, Metal Roof, Molding Floor 82x124 feet, Engines, Blacksmith Shop, and everything in perfect order; can be started any day. Size of lot 300x140 feet, and adjoining half block can be bought if desired. Satisfactory reasons for selling. Terms easy.

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PRICE, $1.50 per hundred.

More agents wanted to canvass and sell POST'S PATENT GALVANIZED METALLIC EUREKA SAP SPOUT and BUCKET HANGER. Samples, Circulars and Terms sent on recept of 20 cents to pay postage. Adedress

C. C. POST, Manuf. and Patentee, Burlington, Vt.

Silicon Steel Works at Sandusky.

A correspondent writing from Sandusky, Ohio, under date of Dec. 24, says:

Mr. E. Gulick, of Starkey, N. Y., president of the "Nes Silicon Steel Co." is in our place looking after the interests of the company, who are building an extensive rail mill here, to manufacture rails by the Nes processes. This company are the owners of all the Nes patents for making steel and iron by the use of the silicon ores. They own wenty-three mines of it in York county, Pa. By a combination of this ore with pig iron in puddling, the iron is purified, and steel is made at a single heat, which differs from any steel heretofore made. Its remarkable welding properties, with its wonderfully tensile strength, toughness, hardness and durability peculiarly adapts it to the manufacture of rails, or for using with old worn out rails in rerolling. The ordinary pile is made of about three-fourths old iron, and one-quarter of Silicon steel, which is placed on the top of the pile, and when heated for rolling, the iron absorbs the steel like a sponge in water, the silicon or flux distributing itself through the whole mass, welding it perfectly under the rolls, making an extraordinary steel headed rail. These rails have been tested by several prominent railroads for the past two years, giving the best satisfaction. The demand for them is steadily increasing throughout the country. The Erie and other roads have made such demands on the Elmira mill as to require the building of another extensive mill to fill their orders for these rails. This rail is claimed by some who have tested them severely for two years to be far superior to all steel rails. They can be as easily rerolled and reworked as iron, while a carbon steel rail cannot. The cost of making these rails, or rerolling old rails by this process, is only ten dollars above the cost of making or rerolling iron rails. Out of 225 miles of track laid on the Erie road within the past two years not a rail has broken, and the rails are apparently as good as when first laid.

The mill at this place will not be excelled by any in the country as a rail mill, and the company are calculating to extend it largely for making merchant bar also, as soon as it is fairly in operation. The people of Sandusky in this, as well as a number of other enterprises, show a great interest, and from present appearances this place will soon rank among the most enterprising manufacturing cities of Ohio. The Lake Shore Railroad, which forsook them years ago, has again returned to its first love, and with its now generous and liberal management and genial officers, beautiful grounds, buildings, ample side tracks and transportation facilities, gives future promise worthy of gratitude. This line have given material encouragement and aid to the Silicon Steel Co., in water privileges, right of way, rates of freight, side tracks and switches, which are highly appreciated and encouraging to manufacturers needing such facilities and favors to foster and win them.

A Philadelphia manufacturer is preparing a plan for a column 1000 feet high, to be constructed entirely of iron, in open work, from the summit of which Fairmont Park and the immediate grounds of the Centennial Exposition are to be illuminated by means of a Drummond light.

Veins of antimony, sixty feet wide, have been discovered in Kern county, California. The ore, it is said, will yield from seventy-five to eighty per cent of crude bullion, containing enough of silver to pay for the mining and reduction, leaving the antimony for net profit.

We are informed that an extensive bed of hematite ore, immediately on the line of the Washington, Cincinnati and St. Louis Railroad, near the top of Shenandoah Mountain, in North River Gap, was discovered by the engineers of that road a few days ago.

The amount of new tonnage which came upon the Northern lakes in 1872 is stated by the *Inter-Ocean*, of Chicago, at 36,762 (of which 14,134 consisted of steamers), an increase of 2401 tons over 1871. The amount of tonnage lost there in 1872 was 22,560, from which it appears that there was a gain of 14,202 tons of new tonnage over the losses.

Get Binders for The Iron Age.

We have made arrangements to furnish KOCH'S PATENT BINDER, which we think altogether the best before the public, to our subscribers at the following very low rates—about the wholesale prices by the dozen:

Half Cloth	.....$1·00	each.
(Cloth Back and Corners, with Morocco Paper Sides—a good, serviceable Binder.)		
Full Cloth	..... 1·50	"
(Morocco Cloth Back and Sides.)		
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(Roan Back; Cloth Sides.)		
Half Morocco	..... 2·00	"
(Morocco Back and Corners; Cloth Sides.)		

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The Binders will each hold the numbers for six months in about the same shape as a bound volume. They can be nicely inserted in two or three minutes by any boy of ordinary intelligence; and when the covers are full they can be either preserved in that shape as bound volumes of *The Iron Age* or they can be emptied and used again. There is no possibility of their getting out of order, unless the cords, which are very strong, wear out, when anyone can easily replace them with a piece of fishing line or other suitable string.

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On receipt of the price we will ship them, safely put up, by any express line or to any New York house to be packed. They are too large to be sent by mail.

The Iron Age.

New York, Thursday, January 9, 1873.

DAVID WILLIAMS . . . . Publisher and Proprietor.
JAMES C. BAYLES . . . . . Editor.
JOHN S. KING . . . . . Business Manager.

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City Subscribers will confer a favor upon the Publisher, by reporting at this office any delinquency on the part of carriers in delivering *The Iron Age*; also, the loss of any papers for which the carriers are responsible. Our carriers are instructed to deliver papers only to persons authorized to receive them, and not to throw them in hall ways or upon stairs; and it is our desire and intention to enforce this rule in every instance.

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Twenty-ninth Page.—Chicago, Cincinnati, St. Louis and London Hardware and Metal Prices.

American Machinery and Tools for Export.

At no previous time in the history of our iron and metal industries, have the possibilities of successful competition with England, France, Germany and Belgium in the production of machinery and tools for export been as fully appreciated by our enterprising manufacturers as during the year just ended. Some instances of successful American competition with foreign manufacturers have even attracted the attention of the general public, such as the shipment of locomotives to Russia, Austria and Alsace-Lorraine, the increasing export of shoe and leather working machinery to Switzerland and the Mediterranean countries, of pulp reducing machinery for paper mills to the Spanish Peninsula, and of tailors' shears to England. Other facts might be mentioned showing the growing demand for American agricultural machinery and implements in many countries, for sugar rolling mills in the West Indies, for iron work of all kinds in South America, &c.; but as our readers are already aware of the growing demand for our improved labor-saving machinery in countries hitherto supplied almost exclusively from British and Continental sources, it is unnecessary to more than call attention to it.

With these facts before us, and a knowledge of the condition and prospects of the iron industries of this and other countries to guide us, we think it is not venturing too much to predict that, in a few years at the furthest, the United States will be in a position to successfully compete with all Europe in the manufacture of machinery and tools for export. The advantage of cheap labor, hitherto all on the side of European countries, is fast disappearing. Emigration has thinned the ranks of skilled labor, and the tendency on the Continent to convert all sorts of private manufacturing enterprises into stock companies of doubtful solidity, will drive to this country many of the small tool makers, who can carry on their business to best advantage here in the establishments driven by a common [illegible] sub-divided into distinct factories, including power, can be had [illegible] atively low rental. A great [illegible] of cutlery have already [illegible] Sheffield, and are now do[illegible] better as small shop owners than [illegible] on wages in the old country.

But other and even more important conditions, affecting the future of the export trade in manufactures of iron, may be instanced in favor of this country. No country of Europe possesses resources of coal and ores which can compare with our own in extent or accessibility. Great Britain has already reached the maximum of her production of both fuel and ores, although of the former her statisticians claim a supply adequate to meet the demands of the country for the next two hundred years at present rates of consumption; but though two centuries may seem a long time, British manufacturers are already having to pay roundly for the discovery that the available coal supply of the kingdom is definitely limited. A parallel is found in the course of the trade in Chinchas Islands guano. While a supply for half a century was in prospect, guano kept barely steady in price. Its export kept on increasing, however, and at the end of twenty years the adjacent islands have already to be looked to to make up the deficiency, and Peru is about establishing an export duty on nitrate of soda, for the raising of sufficient revenue to pay the interest on its debt, hitherto mostly covered by guano.

Last year, for the first time, England was compelled to make large importations of coal from Belgium, and our own mines have also been drawn upon to a less extent to meet the requirements of the market. The diminished exportation of British coal, however, will have a beneficial effect upon the home market, in so far as it will tend to prevent as rapid an exhaustion of the supply as would otherwise be inevitable. But in the matter of wages, we see no opportunity for such a change as will be much, if any, to the advantage of employers. On the contrary, with the purchasing power of the circulating medium steadily decreasing, whether it be in the shape of gold or treasury notes, all over the world, the probabilities are that wages will continue to advance in all Northern Europe until they are high enough to keep the laboring populations from emigrating in large masses. As to raw materials, it may be said that considerable supplies of iron for manufacture may be drawn from Sweden, while the amount of coal obtainable from this country will be limited only by the amount of our surplus production and the facilities for ocean transportation; but under such conditions as those we have indicated, iron manufacture in Europe, and especially in England, will be conducted at a disadvantage in competition with similar manufactures in this country.

As we have repeatedly said during the past two years, we believe that the opportunity is now developing for the establishment of a growing and profitable export trade in manufactures of iron—more especially machinery, tools and implements of labor—a department of invention in which American genius has achieved signal triumphs. For these and kindred manufactures we can without difficulty monopolize the near-by foreign markets. Steamship lines plying to neighboring tropical countries are rapidly multiplying from this and neighboring ports, and the extension of telegraph lines is giving us facilities of commercial intercourse so perfect that an article which, in the ordinary course of business, would have required weeks for its preparation and shipment, was lately ordered from Havana in a government dispatch, delivered on shipboard in four days, and reached its destination within ten days from the sending of the order. The more we accustom our Spanish-American and Brazilian neighbors to look to us for machinery and tools, the greater will be our opportunities of trade in other branches of production and manufacture; and the more effective our efforts to displace European manufactures in countries near our own, the greater our opportunities of successfully competing for the trade of those more remote—especially the Mediterranean and Pacific countries. There is, therefore, every inducement to stimulate our efforts in these directions, and every warrant for the belief that these efforts, if well directed and sustained, will not be unproductive of permanently beneficial results.

Coal Cutting Machinery for American Mines.

It is gratifying to note that the subject of coal cutting by machinery is beginning to attract the attention of mining engineers in this country; and from the discussions already held and promised in future, it is probable that something practical will result. Although a great deal of money has been expended in testing coal cutting machinery in Great Britain, and liberal encouragement offered to inventive talent in the shape of rewards for the best machines entered for competitive trials, American mine owners have manifested but little interest in the subject, and in no instance of which we have any knowledge have such machines been brought into use in this country. For this fact other reasons can be assigned, of course, than the indifference of American mine owners to matters affecting their own interests. No machine has yet been produced which is in all respects, if any, adapted to the working of our American coal mines. The operation of machines of this character is chiefly limited to the cutting of a deep groove into or under the veins, to afford the miners opportunity to break down the coal above by prying or blasting it. Generally, where machines are used, but one such groove is required to the vein; and workable veins of American bituminous coal vary from four to eight feet in thickness, while our veins of anthracite range from twenty to even fifty feet. These facts account in part for the apparent indifference manifested by our mine owners on the subject of coal cutting machinery. Another reason is found in the fact that, in this country, the use of powder in mining operations is very general; and as it is easier to blast out the bottom of the veins than it is to cut under them, economy of time and expense has usually been regarded as of more consequence than economy of coal. The blasting system is extremely wasteful, but as it involves less labor to a given production than almost any other method of working large veins, there is an economy effected in the matter of wages which is generally supposed to more than compensate the mine owners for any loss of coal.

But the highest perfection in the application of machinery to the cutting of coal has not yet been reached. The substitution of compressed air for steam is a great step forward, since by this means better ventilation is secured than when steam is employed and the danger of fire materially lessened. The next step will be such improvements in the cutting tools and the means of operating them as will secure an economy of working expenses, as well as reduce the proportion of waste to the quantity of coal mined. Under our present system fully twenty-five per cent. of the coal broken down in the mines and passed through the crushing machines is lost in slack, and the percentage is still further increased by the loss in transit which cannot be avoided. We are in no immediate danger of reaching the bottom of our coal cellar, it is true, but coal is too precious to waste, even with an abundance remaining in the earth, and the saving of any part of the waste would be so much gained in coal and so much saved in labor which is needed in other branches of production. And the saving of labor, while tending to reduce the cost of coal to consumers, would relieve the mine owners from the oppressive dominition of the miners and tend to prevent those stoppages of production and fluctuation of prices which, under the present system, cannot be guarded against. In the perfection of some form of cutting machine adapted to American mines, and in the improvement of the means of raising to the surface the coal broken down in the mines, are found inviting opportunities for the exercise of that practical talent for improvement for which our inventors are justly famed. The results already reached in England afford an excellent basis—if basis be needed—for such experiments as may tend to the adaptation of coal cutting machinery to both anthracite and bituminous veins, and the utility of such machines would certainly be great enough to justify our mine owners in liberally encouraging all well directed and promising efforts in this direction.

Chinese "Cheap Labor."

The latest novelty in trade movements is the strike among the Chinese workmen at the Beaver Falls Cutlery Works, at Beaver Falls, Pa. The fact is interesting, as showing "the assimilating power of our institutions," it having taken less than a year to transform Chinese immigrants into full-fledged trade unionists on the American plan. The facts of the case are substantially as follows:

On the 9th of June last, 75 Chinese men arrived at Beaver Falls and took the place of that number of white strikers in the cutlery works. By the terms of their engagement contracts they were to receive 75 cents, gold, per day. They were industrious and performed the work allotted to them in a most skillful manner, and the company were so satisfied with the result that they resolved to import another batch. The second instalment of cheap laborers, sixty-nine in number, arrived on the first day of December, 1872, and these, though not less clever workmen than the former, were paid but sixty cents per day in gold. These last arrivals soon learned that there was a difference in wages paid to respective gangs, and, believing that one man was as good as another, a delegation called upon the superintendent and requested that he would immediately raise their wages. The superintendent informed them that he would lay the matter before the proper parties, and, with the assurance that the increase they asked for would be granted, they returned and resumed their work. The matter was subsequently brought to the attention of the Board of Managers, and after some deliberation it was refused. It was feared that if the company yielded in this instance, the Chinese might put on airs and covet a further increase of wages. The celestials were notified that their demand could not be complied with, and thereupon they held a meeting and resolved that they would have recourse to the American expedient of a strike—giving notice to their employers that they would not resume work unless their demands were conceded. From this incident it will be seen that native workingmen are in less danger of being "ruined by Chinee cheap labor" than they feared.

The Postal Telegraph in Congress.

The fact that the attempt to force any one of the several schemes of postal telegraphy through Congress will be the challenge to a free fight in the lobby, encourages the hope that all of them will fail. The adminstration, represented by Mr. Cresswell, want Congress to buy the telegraph lines out and out, and turn them over to the Post Office Department, to be made a part of the postal service. The House Committee on Appropriations, however, decidedly favor the Hubbard scheme, which creates a private company and gives it a monopoly of the telegraph business of the country, under the nominal supervision of the Postmaster General. This does not suit the adminstration, and as the Postmaster General's plan is to be pushed as an adminstration measure, the Hubbard scheme will attract a powerful support from the democratic side, as well as from its friends. There are several other schemes before the committee, all of which have some strength in the lobby and in Congress, and as any plan that may secure the advantage of a favorable consideration in the committee will encounter the united opposition of the friends of those schemes which do not, there is reason to hope that no conclusion will be reached this session. Postal telegraphy, under any name, will be found a dangerous experiment in this country, and we hope it will not be tried.

Once more the danger of war is averted by the peaceful agency of arbitration. The Greek government, after considerable delay and the manifestation of a good deal of unwillingness, has taken good advice and agreed to submit the question of its claims upon the mines of Laurinne to a Joint High Commission, to which the great powers will send delegates. To the decision of this board she will comform, and as there is but little doubt that her unjust claims will be disallowed, her action in this matter must be regarded as an abandonment of the idea of swelling the revenues of the kingdom by means of black mail on the Marseilles Company. We cannot but think that, whatever the justice of the claims, Greece has adopted a prudent policy in this matter. A declaration of hostilities by France and Italy would have resulted in a reopening of the "Eastern Question," and, in the general disturbances which would probably have followed, Greece would have herself in a very uncomfortable and dangerous position. It would not be safe to give Russia so good an opportunity to consummate the traditional policy of Peter the Great, which has been a part of the religion of every subsequent ruler of that country, for another demonstration against Turkey would do for the peace of Europe what pulling out the king pin does for a Chinese puzzle.

The threats of the iron and steel manufacturers of Sheffield to partially suspend operations if the prices of coal and coke were not put down, do not seem to have frightened the coal owners, who are evidently masters of the situation. After considerable deliberation, which was doubtless more for effect than because they had any idea of accepting the ultimatum of the iron and steel trades, they returned the answer, "that, having regard to the demand for "coke being still in excess of the supply, "and also having regard to the considera"tion that the Mines Regulation Act will "come into operation on the 1st of Janua"ry next, the effects of which cannot be "presumed, this association is of opinion "that no change should at present be made "in the price of coke." It now remains to be seen whether the iron and steel masters will be as good as their word, or whether their threat to suspend was made merely to frighten the mine owners. It will be remembered that they were very decided in their declarations, and that they even went so far as to pledge pecuniary aid to such manufacturers as should join the movement in good faith, but who could not afford to let their works stand idle two or three days out of the week. Should they go on as usual, it will be some time before they get their fuel at lower prices than they are now paying, but should they suspend wholly or in part, the workingmen may give them a chance to stand idle longer than they care to. However regarded, their position is an awkward one.

The owners of gold and silver mining shares are troubled in mind about the frequency with which the managers of mining properties are coming down upon them in the form of assessments. Work is being prosecuted on more than one hundred claims in California, Oregon, Nevada and the territories, only one of which has been able to pay regular monthly dividends for any length of time, and not more than half a dozen pay dividends at all. During the last two months of 1872 the assessments on mining shares amounted to $1,300,000, and the total of dividends paid was only $450,000. Since May 1st of last year one hundred and forty-one calls have been made, and only twenty-eight dividends have been paid. Taking the whole year the dividends exceeded the assessments by only about $1,734,000, and when we consider the fact that the capital invested can be counted by millions, the business cannot be said to offer any great allurements to prudent investors. If a part of the capital invested in gold and silver claims had been invested in iron and coal mines, the country would have been richer and more prosperous than it is.

As usual, at this season of the year, trouble is brewing in the anthracite trade. The Miners' and Laborers' Benevolent Association in the Schuylkill region have refused to accept the $2·50 basis proposed by the Anthracite Board of Trade, and in other districts it was rejected without the formality of a vote. The miners clamor for what is known as the Bannan basis of "$2·75, "and $3 per day's work for miners and la"borers, with one cent in three to slide up "and nothing down." The latest move toward an adjustment of the differences of which we have information, was a compromise proposition from the operators to continue the basis of 1872, sliding down if coal goes as low as $2·25 per ton. This was presented through the President of the Miners' Association, and until it is accepted there will be but few collieries at work. No general and long protracted suspension is feared, however, as it is understood that many of the large operators will accept the miners' basis rather than stand idle for any length of time, and the stocks awaiting transportation are more than sufficient to meet the demands of the market in the meantime.

Steam Power in Farm Drainage.

BY JAMES A. WHITNEY, M. E.

In a previous article I have spoken at some length concerning the probable future employment on an extended scale of the mole-plow, as affording one of the prospective opportunities of the greater "use of iron in agriculture." I have here to offer a few suggestions on power machinery applied to forming open drains. The ideas seem to me to be based on solid ground, but their practical development need not be expected save at the cost of much experiment and the elaboration of many minor details. No man doubts the utility of thorough draining, although many demur to its cost. Notwithstanding that scores of ditching machines have been invented, none have worked well in practice, and to make a drain now, as of old, involves the running of furrows with a plow to loosen the soil, and then much delving with pick and lifting with shovel to make the trench. In these days the most costly of all mechanical power is man-power, and next to it is horse-power. Ditching and draining are, therefore, about as expensive as, in the nature of things, it is possible for them to be. And that this is the case is a sad reflection on the enterprise of farmers who have failed to demand some cheap means of relieving lands from surplusage of surface, and subterranean water, and upon engineers who have failed to provide the same. Steam, and steam only, can do the work and do it properly, and to say that it cannot easily be adapted to the purpose is, in the face of the dredging of harbors and digging out of canals by the same agency, simply ridiculous.

The ditching machines hitherto projected have been constructed to be drawn by draft animals and by direct traction, like an ordinary plow. The essential principle has been substantially the same in most of them. A share opened the ground, and lifting devices behind it threw the soil from the trench upon the adjacent surface at its edges. In some, an inclined plane in rear of the share was expected to subserve this function, but the dirt will not rise, by the forward motion of the machine, up an incline of more than about one in five, and for a ditch of any average depth this renders the machine by far too long, to say nothing of the loss of power incurred in forcing the mass over such an extended slope. Recourse has, therefore, been had to endless carrier belts for elevating the dirt from the trench, but these get out of order soon and prove futile; and rotary carriers with lifting buckets on their peripheries are no better. Add to this that the power must all come from animals comparatively unmanageable when used in sufficient number to force the machine through the ground; that the parts must be made strong to stand common, though accidental, strain; and that any moving parts must be actuated like those of a mowing machine, by gearing from traction wheels, and the cause

of failure in horse-drawn ditchers is manifest and needs no comment.

If, instead of this bungling arrangement, we suppose a strong horizontal frame mounted on wheels provided to straddle the line along which the ditch is to be made. On this frame place a transverse double-cranked shaft, rotated from two engine cylinders driven from a vertical steel tubular boiler. On the shaft arrange a disk, say five feet in diameter, and with a width across its face equal to the width of the trench to be made, and furnish upon this face a circumferential series of double mold-boards pointing upward at the front of the disk. The rotation of the latter, in such direction that the mold-boards would throw the dirt upward from the front of the disk, would cause the same to gnaw its way through the earth as fast as the machine was urged forward, the soil, as fast as brought to the top of the disk, being conducted laterally to the banks by suitably arranged chutes. The machine should be urged forward to keep the digging devices up to their work by manual power applied to hand-spikes inserted in holes formed in the faces of the supporting wheels of the main frame. This would simply move the apparatus along as fast as the ditch was completed, and even if the distance were not more than one hundred yards per day, it would be many times cheaper than any method of ditching thus far put in practice. So far as I know this plan has never before been suggested; its feasibility can be shown by calculations based on accepted engineering formulæ, and, properly worked out in matters of detail and proportion, its thorough trial would bring us much nearer the solution of one of the most important difficulties in the way of high farming in this country. Its elaboration offers a clear field to inventors who are willing to throw aside pre-conceived opinions in favor of horse-power for all the purposes of agriculture.

There is another matter connected with this subject which, in some remoter time, will perplex inventors and, in a still later period, reward their efforts with notable success. This is the laying of drains. Machines have been devised whereby a long train of tiles was to be laid one after another in the bottom of a ditch, from an endless belt to which they were fed from a hopper. The use of an endless belt in some form for this purpose will probably be requisite in any apparatus designed for laying drain tile, but I have no account of any actual trial of the machine referred to. Another system of drains, that constituted by concrete laid in pipes in the ditches, and afterward covered up the same as tiles, is also doubtless capable of being carried into effect by mechanism operated by steam-power. But how a continuous tile, for such it would be, could be forced from the throat of a molding machine, as the latter was drawn along the ditch, is a question I leave to projectors who delight in the solution of vexed mechanical problems. But hints less than those I have suggested have frequently been developed into working apparatus by those on the lookout for opportunities for improvement, and to such I commend the topics discussed in the present article.

Scientific and Technical Notes.

In 1828, Sturm & Colladon made a series of interesting experiments at Lake Geneva, Switzerland, to determine the rate of

TRANSMISSION OF SOUND THROUGH WATER.

The sounds were produced by striking a bell suspended from a boat at a suitable depth in the water, while the observers were stationed in another boat at a distance and received the sonorous impressions through a long metallic tube, the lower end of which was closed by a membrane and immersed at a considerable depth in the water. In these experiments the bell weighed about 130 pounds, and the sound was heard at a distance of about 14,000 yards. During the recent siege of Paris the attempt was made to obtain telegraphic communication with the provinces by this device of transmission of sound through water, and the Minister of Public Works confided the necessary experiments to M. Lucas, who reports the following results: The experiments were conducted as in the former instance, and made in the river Seine. Two bells were employed, one of about 80 pounds and the other of 700 pounds weight. In the case of the first the sound was transmitted to a distance of about 1800 yards, while in the case of the second or larger bell only to 1500 yards. There was, therefore, no advantage gained by the increase in the size of the bell—in fact, there was a loss. The great diminution in the distance to which the sound was conveyed in these experiments is accredited by M. Lucas to want of depth in the waters of the Seine as compared with those of Lake Geneva. To what extent the system of transmitting sound can be made applicable to purposes of practical telegraphy, we do not know; but in this connection it is interesting to note that a French inventor will contribute to the Vienna Exposition a

NEW METHOD OF SUBMARINE TELEGRAPHING,

upon which such eminent scientists as Phillipps, Spinelli, Culigny and Fosselle have pronounced favorably. A copper tube filled with water, and atmospheric pressure applied to one end is instantly full at the other, however great the distance. A pressure of 250 atmospheres will be necessary for telegraphing at a distance of 4000 kilometers, the diameter of the hollow space in the tube being 2¾ millimetres. The copper tube will be incased the same as the cables now in use. Most surprising results have been shown at Paris with a length of tube of 500 metres, in the presence of practical men in telegraphic matters.

Mr. Brunfaut, of Vienna, has discovered a method of

SPINNING AND WEAVING GLASS,

by which that substance may be spun into curled or frizzled yarn, and wrought into fabrics of great beauty and strength. These frizzled threads surpass in fineness not only the finest cotton, but even a single cocoon thread, and they appear at the same time almost as soft and elastic as silk lint. These smooth threads are now woven in textile fabrics, which are made into cushions, carpets, table cloths, shawls, neckties, cuffs, collars, and various other articles, and they may be used for weaving the figures in brocaded silk or velvet. As a material for fancy dresses, tapestry for covering furniture, for laces, embroidery, etc., it is thought that this glass tissue will at some future time occupy a prominent place. It possesses a remarkable strength, remains unchanged in light and warmth, and is not altered by moisture or acids. Another great advantage over other textile fabrics which it necessarily possesses, is that of being non-inflammable and incombustible. The composition of this glass material is peculiar to the inventor. The spinning requires extraordinary dexterity and constant attention, and is said to be very trying to the sight. With a wheel of the diameter of five Austrian yards, one operative is able to spin three thousand yards per minute, all of the most uniform size and beautiful quality.

The high cost of fuel in England has directed attention to the development of other motors than steam, especially

TIDE POWER.

At a recent meeting of the British Scientific Association, it was suggested that at any rate one way to utilize it, whatever natural indentations existed in the coast, which could be readily dammed, might be to form these into reservoirs in which water should be stored at high tide, which could be set to work on turbine wheels that should pump supplies into permanent accumulating reservoirs, from whence pipes could be laid to the various manufactories in a town. It was stated that, for example, Bristol was a very favorable situation for beginning this experiment. The rise and fall of the tide there is some twenty-four feet. Half a square mile of water enclosed would, after the most lavish deductions for loss, yield at least five thousand horse-power, which would probably be sufficient to replace the whole power of the stationary engines in the city. This, it was claimed, might be done with the saving of a very large percentage of the present cost, as represented not only in the fuel, but also in labor, engineers' salaries, &c. We understand that experiments are to be undertaken to test the practicability of utilizing tide power by this or a similar plan, experience having shown that there is no economy in the use of such power as may be developed by the rising and sinking of floats.

A correspondent of the Portland *Argus* writing from Brunswick, Me., gives the following information relative to the use of

AIR AS A MOTIVE POWER

in that place: On the Androscoggin River, some three-fourths of a mile below the railroad station, is the site of a mill, long since burned, and the motive power which operates the condenser is a water-wheel at that place. The wheel, it is said, is capable of driving four condensers of equal power with the one now in use. But it is only with results already accomplished that we have to do. At the railroad station is an engine of 10 horse-power, running circular saws for sawing wood, and for various machinery in the blacksmith shop in the vicinity. Thence a small pipe passes on through the village, furnishing power to Worthly Brothers, jewelers, who are running a small engine of about 1 horse-power. Parent & Dafriend also use an engine of 2 horse-power in their blacksmith shop; Dennison & Co., box makers, an engine of 2 horse-power, and Prof. Brackett, of Bowdoin College, one of 3 horse-power, for the manufacture of instruments, while the "laboratory" of the College has one of 6 horse-power. So that, nominally, this small condenser furnishes in all 24 horse-power, and all unite in saying that the "air power" is much more efficient than steam in working the same engines. It does not drag, but recovers itself instantly from any strain or check, and is in every way a success.

BLACK VARNISH FOR METALS.

At the Paris Exposition of 1867 there were furnaces and ovens in the French department which were covered with a brilliant thin black varnish that could scarcely be scratched off. Other metallic articles from Paris, such as corset steels, were coated with an elastic varnish, not affected by heat. The great uniformity, as well as the absence of any brush marks, led the chemist Tuscher, in Nuremberg, to the supposition that the covering had probably been produced otherwise than by painting or immersion, and various trials led to the discovery of the following process of coating metal surfaces with an indestructible varnish. The bottom of a cylindrical cast iron pot of 18 inches deep is covered to half an inch with bituminous coal dust. An inch higher a grate is placed, the remaining space being filled with the articles to be coated. In addition to various cast iron articles, Tuscher selected articles of iron wire, brass, zinc, band steel, tinned sheet iron and pottery. The pot is covered with a light fitting lid and placed over a coke fire, under a well-drawing stack. At first only moisture evaporates, but soon coking takes place, and dark brown, irritating vapors escape. The coking may then be considered complete, and after the bottom of the pot has been brought almost to a red heat for a quarter of an hour, it is withdrawn and uncovered after ten minutes, so that the contents may dry.

Metals thus treated are found to be coated with a brilliant black varnish, which not only prevents oxidation, but also resists high temperatures. In fact, it only disappears when the metal is heated to a bright red, and is very suitable for furnaces. To fine articles of iron-wire, such as sieves, a remarkably uniform covering may thus be imparted, far superior to anything which can be produced by painting. Tin or tinned wares, or such as are soldered with soft solder, however, cannot be treated by this process, owing to the high temperature necessary. It may be remarked that, in the coking of the coal, the noxious tar products that occur when the air is excluded, such as is the case in gas-works, do not occur in this process. The varnish is, for this reason, perfectly odorless. If the coking is pushed too far the articles lose their brilliancy and get dull, and the varnish lacks in tenacity and durability. Small articles, such as hooks and loops, can be provided with this varnish, if they are heated sufficiently long in a revolving-drum with small particles of coal. The application of colophony, instead of coal, yielded no satisfactory results.

THE PREDECESSORS OF BESSEMER.

As in every important discovery, certain observations and experiences preceded the Bessemer process. E. Stoelzel, in his excellent treatise *Die Metallurgie*, informs us that it seems as if the Japanese already had made use of the action of a current of air upon molten pig iron. Clobbon communicated the interesting fact to the Irish Academy that, according to a translation of Mendelslo's Travels, published in London in 1669, the Japanese were acquainted with a particular melting process more than two centuries ago. Liquid iron is poured into a vessel lined with clay, and retained in a fluid condition by the application of a blast, and without fire, whereupon it is ladled out and cast "in a better and more artificial manner than the inhabitants of Lieges are able to." In Germany the action of a current of air upon liquid pig iron has been used for some time for refining. On the 15th of September, 1855, I. G. Martin, of the United States, patented in England a process by which the refining was accomplished by conducting the pig flowing from the furnace through a perforated groove, in which it was brought in contact with vapor or air, or with both at the same time. The Englishman, Clay, proposed to expose the pig iron to a current of air by letting it fall down in drops and then to convey it into the refining or puddling furnace. And a few months before the publication of the Bessemer patents, Perry conducted the following remarkable trial at the Ebbw Vale works: Longitudinally to the hearth there were placed several iron pipes surrounded with clay and provided with numerous holes. The pig was allowed to flow on the hearth while blast was forced through the the pipes. A violent reaction took place, but, as the experiment could not be conducted to the end, it was not repeated. The first patent of Bessemer dates October 17th, 1855.

The number of

ARTISIAN WELLS IN CHICAGO

is multiplying rapidly. Twenty-one of them having already been bored, and in no instance has a failure to obtain a plentiful supply of water occurred. The well at Kenwood, just south of Chicago, 1255 feet deep, and 5½ in. diameter at the bottom, yields 650 gallons per minute. It cost about $6000. Another well, in the business center of Chicago, is 1600 feet deep, yields 525 gallons per minute, and cost $7000. The usual depth of the wells is from 1200 to 1300 feet, and the average cost is $6000 for a 5½ in. well 1200 feet deep, and $5000 for a 4½ in. bore to the same depth. The surface pressure of the water varies from 22 to 35 lbs. to the square in., and the latter pressure is sufficient to throw a stream to the hight of 100 feet. The deepest well in Chicago is in the South Park, where the bore, 3½ in. in diameter, has been carried down 1640 feet. The comparative smallness of the flow from this well is adduced as an argument in favor of larger borings.

M. de Caligny's

IMPROVED SYSTEM OF LOCKAGE FOR CANALS,

proposed originally in 1845, and applied with modifications to Aubois Canal, in France, begins to attract the attention of European engineers. It is extremely simple in design and management. In ordinary locks, in passing any boat, a volume of water is consumed equal to the surface of the lock, multiplied by the level of the two reaches of the canal. It is easy to see that such a system is very wasteful, as the lock has to be replenished every time a boat passes. Caligny proposed a double lock between the two compartments of which communication was established by means of large pipes. When a boat is enclosed in the first chamber the communication between the two chambers is opened and a common level in this way obtained. The lock-gate is then opened and the boat goes into the second chamber. This chamber is then brought to a level with the reach of the canal on which it opens and the boat goes out. The result is that at every lockage the chambers only require to be partly filled or partly emptied from the higher or into the lower reaches. Still further to diminish the loss in this respect, M. de Caligny has proposed auxiliary basins (*bassins d'epargne*), in which, each time the lock is emptied, the water is collected in a body at a slightly lower level, whence it can be restored to it without much loss. The saving of time and force by this invention is considerable, and our Canal Board would do well to inquire into the feasibility of applying Caligny's system to the locks on the Erie Canal.

A new

MACHINE FOR MEASURING AND TESTING ILLUMINATING GAS

is now employed in London for testing officially the quality of the gas furnished by companies for the public consumption. The apparatus consists, first, of a gas meter which presents two conspicuous index hands, one of which revolves in a minute, while the other makes a complete revolution during the passage through the meter of 1-12th of a cubic foot of gas. The first of these movements, being maintained by clock-work, is constant. The second, being dependent on the velocity of flow, or what is the same thing, on the rate of burning, may be varied by varying the freedom of discharge. Since 1-12th of a cubic foot of gas passes with each revolution, if the revolution occupies one minute there will pass one cubic foot in twelve minutes, or five cubic feet per hour. As the law requires that the gas shall possess an illuminating power, when burned at the rate of five cubic feet per hour, not inferior to that of fourteen sperm candles consuming each 120 grains of the combustible in the same time, this apparatus, when combined with a suitable photometer, is said to make the application of the test very easy. Before entering the meter, the gas passes through a governor, which maintains the burning pressure uniform, however variable may be the pressure in the mains.

The Mines of Laurium.

A telegram from London, bearing the date of December 27th, announces that the Ministers of Austria, Germany, and Russia at Athens, acting on instructions from their respective governments, have jointly advised the Greek government to end the dispute about the Laurium silver mines by conceding the demands of France and Italy. We have already discussed this subject so fully that it is only necessary to say that the troubles between Greece and the governments of Italy and France are owing to the conflicting claims of Greece and a company composed of Italian and French subjects to the valuable silver mines of Laurium. These mines, in ancient times, supplied the Greeks with the ore for the coins which are now stored away among the collection of antiquaries and public institutions throughout the world. For a long time these mines were abandoned by workmen, and the district was only visited by curious travelers. The Greek government, about ten years ago, made various efforts to test these mines, but failed to see its way clear to make any immediate profit from working either the refuse ore and scoria in the neighborhood mentioned by Strabo, or from the mines, the shafts of which were very numerous. In 1863 a French metallurgist named Roux, and an Italian, Serpieri, carefully investigated the material about the mines. Two years later, having ascertained that the mines might be worked with profit, they purchased the land, and obtained what they believed to be adequate concessions from the Greek government. They formed the Laurium Mining Company, and having secured a large amount of capital, they made extensive preparations for beginning the work. Numerous buildings and furnaces were erected, a town of 3000 inhabitants was built, a deserted bay was converted into a frequented port, men of science of many different nationalities were engaged in the direction of the operations, and 2000 workmen were employed at rates of wages never before known in the country.

The concessions which the company demanded and imagined it had obtained were to entitle it to the argentiferous lead ore, whether in the mines, or on public or private lands, within a certain limit, according to the Greek law. It asserts that the concessions gave the right of property in the refuse ore, or *ekbolas*, as Strabo calls it, as well as the scoria and ores in the mines. The Greek government did not contest this claim until about two years ago, then arguing that the concessions did not include the surface ore. The mines had proved to be valuable, and from that time, also, the arbitrary interference of the Greek government began. Political leaders out of place and the Athenian press came to the conclusion that a treasure had been found, and seized the opportunity of working on public opinion to such a degree that all Greece was persuaded that the surface ore was a fund of wealth, and that $40,000,000 could be obtained from it without difficulty. The surface ore was regarded as an inalienable inheritance of the Greek nation. The people were taught to believe that no *bona fide* employment of this species of property could give any right to a portion of this national wealth. The result of this popular excitement was that the Greek government procured the enactment of a law prohibiting the company from continuing to make use of the ore in dispute until the right of property should be determined by the Legislature. A month afterward, after animated discussions in the Chamber, a law was passed declaring that the refuse ore was national property. During the discussion it was explicitly declared that one of the objects of the law was to close the Greek tribunals against any claims on the part of the foreign mining company. In order to give retroactive force to the law, not only an exorbitant tax was imposed on the company for the future, but for the eight years before the passage of the bill, while the company was working the mines, $400,000 was demanded by the government.

The projectors of the enterprise thereupon appealed to their respective governments for protection against what they considered an act of spoliation. As France was prevented by the war with Germany from taking active measures in the interest of the company, and the appeal to the Italian government was also fruitless, the company was forced to offer the mines to the Greek government for $2,800,000. The Greek Premier at that time, Komoundouros, accepted the offer and promised to lay a bill, to effect the transfer, before the Chambers. Nevertheless, on learning that he would not be able to procure the passage of the bill, he resigned. His successor, Deligeorgis, refused to recognize the arrangement, and conceived the plan of laying the question before the courts. In the meantime the French and Italian governments had begun to take an interest in the subject, and demanded that the Greek government should either agree to a compromise with the company or refer the question to the arbitration of an international commission. After a new ministerial crisis in Greece, the government of that country proposed that the company should remain in possession of the mines upon paying a tax of 40 per cent. of its profits. This the company refused, and the proposition was again made to bring the case before the courts of Greece. The company, not without some apparent justification, hesitated to do this, considering the courts indisposed to decide impartially. According to the foregoing telegram a new feature in this complication has been introduced by the combined efforts of three of the great Powers of Europe.

The Albert Bridge at Chelsea.

The London *Times* describes the new suspension bridge across the Thames, at Chelsea, as follows:

The bridge consists of a central opening 400 ft. wide, and two side openings, each 155 ft. wide. The piers upon which the four towers are now being reared are formed of cast iron cylinders, sunk down into the clay and filled with concrete. They are 15 ft. in diameter from the platform level down to within 10 ft. of their bases, at which point they are gradually enlarged by a tapering ring to 21 ft. at the bottom. These bottom, or cutting rings, are remarkable for being the longest cylindrical castings ever turned out in one piece, the dimensions being 21 ft. diameter by 4 ft. 6 in. high and 1⅝ in. thick. The rings were floated on barges to the staging of the bridge, where they were taken from the lighters by means of powerful cranes, and lowered into position on the bed of the river. The bridge is 710 ft. long and 41 ft. wide between the parapets. These parapets are really the main girders of the bridge, which are of wrought iron, 8 ft. deep, and continuous from end to end of the structure. The upper portions of the plates forming the webs of the girders are perforated at intervals, the perforations being covered by open work castings of ornamental pattern, which give an appearance of lightness to the bridge as viewed from the river. To the top flange of each of the main girders is bolted a cast iron hand rail. The main girders are connected at their bottom flanges by a series of cross girders placed 8 ft. apart, and on these are laid 3 in. planks, to which 6 in. longitudinal timbers are fastened. On these, again, is laid a decking of 1 in. boarding, upon which the wood blocks forming the roadway are bedded in bitumen with the grain end upward, and spiked down. The carriage way is 27 ft. wide, and there are two foot paths, one on either side, each 7 feet in width. These are being paved with slabs of Ransome's patent stone, 12 in. square and 1½ in. thick, laid diamond pattern on a wood decking, with an interposed layer of tar and asphalted felt. The slabs in the center of the path ways are of a gray tint, bordered by others of a red color.

The towers are built on piers placed outside the parapet girders, an arrangement which is very effective in a constructive point of view, inasmuch as it enables the observer to fully realize the idea of a perfectly suspended platform, from end to end of the structure. The towers are placed in two pairs, each pair at a distance of 160 ft. from either shore, their work being to carry the main chains of the bridge. At a hight of 60 ft. from the roadway of the bridge each pair of towers will be connected by an ornamental iron arch. The towers are constructed of cast iron, each one consisting of a group of columns, the inner one of which is 4 ft. in diameter externally. Around this central column are eight 12-inch octagonal shafts, placed 12 inches away from the main shaft. The whole group is connected at intervals by ornamental collars of cast iron, the arrangement giving somewhat the effect of Gothic-clustered columns.

In the Albert bridge the straight chains are composed of wrought iron bars, united end to end by riveted joints, and having swelled heads at the extreme ends only, where the chains are connected with the main girders and the towers. The curved cable from which these straight chains are suspended is composed of steel wires, bound together by an external coiled wire, the diameter of the cable being 6 in. Another peculiarity in the construction of the Albert Bridge is the novel method adopted by Mr. Ordish in forming the anchorages. In this new bridge at Chelsea, however, they are not dependent upon such enormous masses of material as were previously required, but contained within an iron structure. A cast iron cylinder, 20 ft. 6 in. deep and 3 ft. interval diameter, is used at each of the anchorages, being set vertically in a bed of concrete, the bottom of which is 26 ft. below the level of the roadway of the bridge. The cylinder is enlarged at the bottom into a chamber 5 ft. in diameter, in which the chains are anchored. It is provided with a manhole and steps, so that ready access can at all times be had to the anchorages, which can thus be examined at intervals and painted when necessary. From the bottom of the cylinder a vertical anchorage chain is carried up to the end of the main girder, to which also is connected the principal back chain of the bridge and the wire cable. By this arrangement the horizontal strain is taken through the main girder, the vertical lift being resisted by the concrete setting of the cylinder, which is only about one-tenth the quantity required in the ordinary system for suspension bridges of similar dimensions.

The roadway of the embankment at the foot of the bridge is at a lower level than that of the bridge, so that a special arrangement for effecting communication between the two became necessary. In carrying out this object advantage has been taken of the large open space which at present exists between the river wall and Oakley street, and which affords ample room for connecting the two works. Under the approach roadway of the bridge an opening 15 ft. wide will be made, through which foot passengers passing along the pathway on the embankment continue their course from Chelsea to Battersea Bridge, or *vice versa*. Those, however, who desire to cross the bridge, reach its roadway by ascending a short flight of steps provided on either side close by the point where the embankment footway passes underneath.

Trade Report.

Office of THE IRON AGE,
TUESDAY EVENING, Jan. 8, 1873.

The past week has been a quiet one in Wall street. Up to Saturday the money market remained very stringent, but on Monday the rates on call fell to 7 per cent., currency, per annum. For the next two months the tendency of the market will be toward greater ease, although it is not probable that money will be positively easy for some time to come; although there is every prospect that money will be in sufficient supply for all legitimate purposes if the Treasury will refrain from interfering with the market. It is believed that the usury laws will be repealed in this State during the present session of the Legislature, and that Congress will yield to the popular demand for free banking. For mercantile paper there has been more inquiry, and the best names have been discounted at 10 @ 12 per cent.

The gold market is without important feature. The extreme fluctuations of the premium are as follows:

	Highest.	Lowest.
Thursday	112¼	111¾
Friday	111¾	111⅝
Saturday	111⅝	111⅝
Monday	111¾	111⅝
Tuesday	111⅝	111⅝
Wednesday	112⅛	111¾

In the stock market there has been but little doing. Speculators operating in view of the rise expected during the first week of the year have been disappointed. The market closes moderately active and unsettled. The highest and lowest of to-day's prices are given below.

The bond market has been strong throughout the week, both here and in Europe. State bonds, railroad securities and investment shares are dull. The closing prices of governments are given below.

In foreign trade the movements of the week have been as follows:

IMPORTS.

	1870.	1871.	1872.
Tot. for week	$5,124,336	$7,495,607	$6,286,804
Prev. reported	299,314,392	372,586,483	418,730,591
Since Jan 1	$304,438,788	$380,082,090	$425,017,49

Included in the imports of general merchandise for the week are:

Anvils	223	$3,014
Brass goods	27	4,542
Bronzes	7	866
Chains and anchors	62	3,246
Copper	...	27,962
Cutlery	91	32,097
Guns	43	5,429
Hardware	83	7,847
Iron. hoop, tons	6	394
Iron, pig, tons	1,056	32,982
Iron, sheet, tons	25	2,226
R. R. bars	9,192	141,648
Iron tubes	837	2,050
Iron, other, tons	2,179	109,113
Lead, pigs	3,725	19,928
Lead, tons	11	1,116
Metal goods	154	19,853
Nails	2	583
Needles	23	12,434
Old metal	...	5,550
Platina	2	2,835
Per. caps	6	1,121
Saddlery	12	2,032
Steel	3,077	54,997
Spelter	49,869	2,701
Silver Ware	4	204
Tin, boxes	15,478	134,397
Wire	144	8,315
Zinc	115,048	7,432

EXPORTS EXCLUSIVE OF SPECIE.

	1871.	1872.	1873.
For the week	$4,187,739	$3,199,209	$3,513,906

EXPORTS OF SPECIE.

Total for the week	$831,920
Previously reported	71,545,275
Total since January 1, 1872	$72,311,195

The bank statement for the week shows a gain of $2,282,100 in total reserves, and an increase of $5,319,300 in total liabilities. The banks now hold above the legal requirement $2,788,025 in lawful money, a gain of $952,275 over last week. The reserve items are all made on rising averages, and the banks are stronger than they seem from this statement. The following is a comparison of the averages for the past two weeks:

	Dec. 28.	Jan. 4.	Differences.
Loans	$274,572,400	$277,720,900	Inc. $3,148,500
Specie	17,241,800	19,478,100	Inc. 2,236,300
Circul'tion	27,573,000	27,613,800	Inc. 40,800
Deposits	198,529,600	203,808,100	Inc. 5,278,500
Leg. Ten.	41,119,600	41,165,400	Inc. 45,800

Foreign exchange is strong and higher for sixty-day sterling. We quote:

	60 DAYS.	3 DAYS.
Prime bankers' sterling bills on London	109⅜ @ —	110⅛ @ —
Good bankers' do	109⅜ @ 109⅝	110¼ @ 110⅜
Prime com. sterling do.	108¾ @ 109⅛	— @ —
Paris (bankers)	5·22½ @ 5·23¼	5·17½ @ 5·18¾
Antwerp	5·20 @ 5·21¼	5·15 @ 5·16¼
Swiss	5·18¾ @ 5·20	5·13¾ @ 5·15
Amsterdam	40⅜ @ 40⅝	41 @ 41⅛
Hamburg	96⅛ @ 96⅜	97⅛ @ 97⅜
Frankfort	41⅜ @ 41½	41¾ @ 41⅞
Bremen	95⅞ @ 96⅛	97⅜ @ 97⅝
Prussian thalers	72 @ 72¼	72¾ @ 73

Government bonds at the close were firm. We quote:

	Bid.	Asked.
U. S. Currency 6s	113	113⅓
U. S. 6s, 1881, reg	115⅛	115⅞
U. S. 6s, 1881, c	116	116⅓
U. S. 6s, 5-20 reg. May and Nov.	113	113⅓
U. S. 6s, 1862, c	113¼	113⅓
U. S. 5-20 1864, c	113⅛	113⅞
U. S. 5-20 1865, c	114⅛	115
U. S. 5-20 1867, r. Jan. and July	114⅛	114⅞
U. S. 5-20 1865, c. Jan. and July	113¾	114
U. S. 5-20 c. 1867, " "	114¾	115
U. S. 5-20 c. 1868	114¾	115
U. S. 10-40 reg.	110⅛	110⅞
U. S. 10-40 c	110⅛	111
U. S. 5s of 1881, reg	112⅛	112½
U. S. " c	112⅛	112½

The following were the highest and lowest prices of stocks to-day:

	Highest.	Lowest.
N. Y. Cen. & Hudson Consolidated	102¼	101¾
Lake Shore	96⅞	96⅞
Rock Island	110⅜	109⅞
Wabash	74⅝	74
Harlem	115¼	115
Western Union Telegraph	80⅜	79⅝
Northwestern	82	81⅜
Milwaukee & St. Paul	54	53⅞
Pacific Mail	72¼	70⅜
Erie	62⅜	62⅛
Ohio & Mississippi	48¾	47⅜
Boston, Hartford & Erie	9¼	8¾
Union Pacific	38½	38
C. C. & I. C.	38⅛	38⅛

GENERAL HARDWARE.

The principal interest at this early stage of the year is centered in the numerous changes in lists and discounts which are customary at this time. Trade is dull, but as little is expected, few complaints are heard.

In our last issue we published a circular of Henry Disston & Sons, giving notice of a revision of prices; below will be found a copy of such portions of the list as have been revised, also the discounts for the various goods enumerated in their new catalogue issued under date of 1st instant. It will be seen that the list prices of Hand, Panel, Rip, Buck, Compass, Pruning, and Wood Saws, Butchers' Bow Saws and Blades, Turning and Felloe Webs and Plastering Trowels are unchanged.

Circulars, Cross Cut, Mill and Mulay Saws, and Saw Mandrels.....dis. 12½ per cent.
Hand, Panel, Rip, Buck, Compass, Pruning and Wood Saws, Wood Saw Frames, H. Saw Handles, Turning and Felloe Webs, Band Saw Blades, Cane Knives, Butchers' Bow Saws, Butchers' Saw Blades and Plastering Trowels.....dis. 7½ per cent.
Try Squares, Bevels, Screw Drivers, Screw Driver Handles, Gauges, Plumbs and Levels, Pocket Levels and Level Glasses, dis. 40 per ct.
Barker's Patent Double Reversed Joint Butts and Concealed Door Springs, Saw Screws, Slaw and Crout Cutters.....dis. 10 per cent.

CIRCULAR SAWS.

Diam't'r.	Gauge.	Size of Hole.	New List. Each.	Old List. Each.
4 inch.	19 gauge	¾	$0 85	$0 75
5 "	19 "	¾	1 00	95
6 "	18 "	¾	1 20	1 15
7 "	18 "	¾	1 45	1 40
8 "	18 "	⅞	1 75	1 65
9 "	17 "	⅞	2 10	2 00
10 "	16 "	1	2 50	2 40
12 "	15 "	1	3 40	2 90
14 "	15 "	1¼	4 00	3 45
16 "	14 "	1¼	4 75	4 25
18 "	13 "	1¼	5 50	5 05
20 "	13 "	1 5-16	6 50	6 10
22 "	12 "	1 5-16	7 50	7 15
24 "	11 "	1½	9 00	8 50
26 "	11 "	1½	10 50	10 60
28 "	10 "	1½	13 00	12 70
30 "	10 "	1½	15 50	14 85
32 "	10 "	1½	18 00	17 00
34 "	9 "	1½	20 50	19 15
36 "	9 "	1½	23 50	22 30
38 "	8 "	1½	28 00	26 60
40 "	8 "	2	32 50	30 80

HENRY DISSTON & SONS' CELEBRATED EXTRA SPRING STEEL CROSS-CUT SAWS.

	Old Price.
Comprising the Champion, Climax, Great American, Lumberman, Nonpareil, and Hook Tooth, set and sharpened, 70 cents per foot	75 cts.
One Man Cross Cut, set and sharp'd	$3 00
Cast Steel Pit Saws, $1 00 per foot	1 05

IMPROVED REVERSIBLE HACK SAW.

Inch.	New List.	Old List.
8	$15 00	$16 00
10	16 00	19 00
12	17 00	22 00

BEVELS.

No. 1 Rosewood, Heavy Brass Plated, Blade Hardened and Tempered.

	New List.	Old List.
6 ₰ doz.	$6 50	$5 00
8	7 00	5 50
10	7 50	6 00
12	8 00	6 50
14	8 50	7 00

No. 2 Rosewood, Brass Plated, Blade Hardened and Tempered.

6 ₰ doz.	$5 50	$4 00
8	6 00	4 40
10	6 50	4 80
12	7 00	5 20
14	7 50	5 60

GAUGES.

	Per doz.	
Beechwood, oval Bars, marked with inches, steel point	$1 14	$0 85
Beechwood, Head Plated, oval Bar, marked with inches, Steel point	2 00	1 60
Boxwood, oval Bar, marked with inches, Steel point	3 66	2 75
Boxwood, Head Plated, marked with inches, Steel point	4 35	3 25
Beechwood, Cutting, marked with inches, Steel Cutter	2 00	1 59
Beechwood, Cutting, Head Plated, oval Bar, Steel Cutter	3 35	2 50
Boxwood, Head Plated, oval Bar, Steel Cutter	4 00	3 50
Mortise, Rosewood, Brass Slide	7 30	5 00
Mortise, Applewood, Screw Slide, Brass Thumb Screw	10 00	7 50
Mortise, Rosewood, Screw Slide, Brass Thumb Screw	11 00	8 25
Mortise, Rosewood, Screw Slide, Head Plated, Thumb Screw	13 35	10 00
Mortise, Rosewood, Screw Slide, Stem and Plated Thumb Screw	15 00	11 25
Mortise, Rosewood, Full Plated, Head and Stem, Screw Slide	20 00	15 00
Mortise, Boxwood, Full Plated, Head and Stem, Screw Slide, marked with inches	21 35	16 00

SCREW DRIVERS.

	Per doz.	$
Steel Blades, forged, Polished Handles, Solid Ferrule, 1½ inch	$1 00	
Steel Blades, forged, Polished Handles, Solid Ferrule, 2 inch	2 00	1 55
Steel Blades, forged, Polished Handles, Solid Ferrule, 3 inch	2 40	1 80
Steel Blades, forged, Polished Handles, Solid Ferrule, 4 inch	2 95	2 35
Steel Blades, forged, Polished Handles, Solid Ferrule, 5 inch	3 55	2 65
Steel Blades, forged, Polished Handles, Solid Ferrule, 6 inch	4 20	3 15
Steel Blades, forged, Polished Handles, Solid Ferrule, 7 inch	4 80	
Steel Blades, forged, Polished Handles, Solid Ferrule, 8 inch	5 32	4 00
Steel Blades, forged, Polished Handles, Solid Ferrule, 9 inch	6 95	
Steel Blades, forged, Polished Handles, Solid Ferrule, 10 inch	7 15	5 35
Steel Blades, forged, Polished Handles, Solid Ferrule, 12 inch	9 45	7 10

SCREW DRIVER HANDLES.

Polished, Bored, and Slotted,	2 inch.	$1 05	$0 80
" "	3 "	1 10	0 80
" "	4 "	1 15	0 80
" "	5 "	1 20	0 90
" "	6 "	1 25	0 90
" "	8 "	1 35	1 00
" "	10 "	1 55	1 15
" "	12 "	1 75	1 30

Handles assorted to order.

PLUMBS AND LEVELS.

	New List.	Old List.
Adjustable Mahogany Plumb and Level, Brass Lipped, Side Views, Polished, Assorted, 26 to 30 inch	33 00	16 50
Adjustable Mahogany Plumb and Level, Brass Lipped, Side Views, Polished and Tipped, Assorted, 26 to 30 inch	48 00	21 00
Adjustable Triple Stock Plumb and Level, Brass Lipped, Side Views, Polished and Tipped, Assorted, 26 to 30 inch	48 00	24 00
Adjustable Triple Stock Mahogany Plumb and Level, Brass Lipped, Side Views, Polished and Tipped, Assorted, 26 to 30 inch	65 00	32 00
Mason's Plumb and Level, 36 inch	18 00	9 00

POCKET LEVELS.

Iron, Japanned Tops	$2 50	$1 50
" Brass Tops	3 00	1 75

SLAW CUTTERS.

1 Knife ₰ doz.	$5 00	$3 25
2 Knives	8 50	7 75
3 Knives	9 60	8 75
Vegetable Cutter	3 25	3 00

TRY SQUARES.—DISSTON & SONS.

No. 1. Rosewood, Steel Blade, marked with inches Hardened and Tempered.

Inch.	New List.	Old List.
3 ₰ doz.	$5 50	$3 40
4	6 25	3 80
5	7 25	4 20
6	8 00	4 40
7	9 00	5 00
8	10 25	5 80
9	11 00	6 40
10	12 50	7 20
12	16 00	9 00
14	19 00	11 50
15 with rest	20 00	12 00
16 "	21 50	13 60
18 "	24 00	15 20

No. 2. Rosewood, Steel Blade, Hardened and Tempered.

3 ₰ doz.	$3 00	$2 40
4	3 50	2 75
4½	3 75	2 95
5	4 25	3 10
6	5 00	3 30
7	5 50	3 65
7½	5 75	4 05
8	6 00	4 40
9	6 50	4 75
10	7 25	5 30
12	8 50	6 60
14	11 25	8 00
15 with rest	12 50	8 95
16 "	13 50	9 20
18 "	15 50	11 75

No. 4. Improved Spirit Level, Combination Square, comprising Spirit Level, Blade marked with inches, and Scratch Awl, Mahogany, Brass Plated both sides.

8 ₰ doz.	$17 50	$10 50
10	20 00	12 00
12	22 25	13 50
14	25 00	15 00
16 with rest	28 75	17 25
18 "	32 50	19 50

The Rule Makers met in convention in this city to-day (Wednesday), and established the price of Rules at discount 40 and 10 per cent., instead of 30 and 10 per cent. previously. The Pump Makers have been in session to-day at the St. Nicholas Hotel, but up to this evening nothing had transpired as to their action.

The Providence Horse Shoe Co., under date of 1st instant, have issued a circular in which they say, "That on and after this date the price of Patent Toe Calks will be 13 cents per pound, net cash, on which we will make the following discounts and terms, to wit:

1000 lbs., 5 per cent. discount from list price.
5000 " 7½ " " " "

"Invoices will be rendered and settled at the full list prices, and discounts made and credited on July 1st and January 1st, to parties entitled thereto, and who have not undersold our current rates. Parties offering our Calks at less than such prices will forfeit all claims to the discount." The above prices subject to change without notice. Abraham Bussing, No. 35 Chambers street, is sole agent for these goods. Putnam's Horse Nails have been reduced 2 cents per lb. on all numbers except No. 5, which is reduced 1 cent. The following are now the prices:

No. 5	6	7	8	9	10
32	28	26	25	24	23 cents per lb.

The Patent Family Glue Pot is now quoted discount 25, instead of 10 per cent., and by the case of half a gross, discount 30, instead of 20 per cent. The list price is $5 per dozen. The numbers of Silver Lake Sash Cord have been changed as follows: No. 5 to 6, 6 to 7, 7 to 8, 8 to 9, 9 to 10, 10 to 12. The new numbers indicate the diameter of the cord in 32ds of an inch. The price of the Fairy Gas Fluting Machine has been reduced from $12, net, each to $10, which makes it a very cheap article. We believe the price at which they were first put on the market was $20, net. The Providence Tool Company will issue, this month, a new discount sheet of Ship Chandlery Goods, and in February a catalogue of all their manufactures, with revised list prices.

The Stanley Rule & Level Co. have issued a condensed Price List, of which they say, in introduction:

"The within Price List is presented to our customers as embracing in a compact and convenient form the *full* line of superior Mechanics' Tools, etc., manufactured by us and with prices revised to date. The changes made in List Prices since our Illustrated Catalogue for 1872 was issued are very few in number, and were mostly contained in our Circular sent out in July. The present Condensed Price List may properly be inserted as an Appendix to our Illustrated Catalogue. It will also be found a great convenience to Buyers, to Salesmen, and to Entry Clerks, in the handling of our goods. Extra copies will be furnished on application."

The following discounts are given on a sheet accompanying the condensed catalogue of the Stanley Rule and Level Company, under date of January 8, 1873:

	Dis. per cent.
Auger Handles	30
Awl Hafts and Handles	20
Awls, Pegging and Sewing	30
Brad Awl Handles	20
Brad Awls, Handled	20
Bevels, Sliding T	40
" " Improved	15
" Bailey's Patent Flush	15
Cabinet Makers' Clamps	20
Chalk-line Reels and Awls	25
Carpenters' Tool Handles	30
Cattle Ties	20
Chisel Handles	10
Compass Dividers	15
Countersinks, Wheeler's Patent	25
Dowel Sharpeners, Wheeler's Patent	25
Door Stops, No. 6	15
" Nos. 8 and 9	30
File Handles	10
Gauges	40
Hammer Handles	10
Hatchet "	10
Hand Screws	20
Level Glasses	50
Mallets, Hickory	10
" Lignumvitæ	10
Mitre Squares, Improved	25
Planes, Bailey's Patent	15
Plane Irons, "	15
Plane Handles	20
Pinking Irons	50
Plumbs and Levels	50
Plumbs and Levels, Iron Frame	15
" " Nicholson's Pat	15
Pocket Levels, Improved Patterns	40
Plows, Miller's Patent Adjustable, with Filletster	25
Plow and Matching Plane Combined	25
Rules, Stanley's	40
Miscellaneous Articles, "	40
Rules, Stearns'	40
Miscellaneous Articles, "	40
Sash Frame Pulleys	20
Sash Cord Irons	10
Scratch Awls, Handled	30
Saw Handles	20
Screw Drivers, No. 1	25
" " No. 2	40
Steak Hammers	10
Shoemakers' Hammers	10
Spoke Shaves, Bailey's Pat	Net
Spoke Shave Cutters	Net
Tackle Blocks	15
Tack Hammrrs	10
Trammel Points	20
Tool Handles "Excelsior"	15
Try Squares	40
" " Improved	25
Try Squares, Plumb and Level	40
" " and Bevel combined	15
Upholsterers' Hammers	10
Veneer Scrapers, Bailey's Patent	15

Discount for cash 10 per cent.

Charles Peace, agent for Joseph Rodgers & Sons, gives notice of the following advances:

From and after this 1st instant, advances will be charged as follows, viz.: 10 per cent. advance on Erasers, Razors, Razors in cases, Razor Strops, Farriers' Knives, Shoe Knives, Bowie Knives, Champagne Nippers, Nail Nippers, Spring Cutlery, and Button Hooks. 15 per cent. advance on Ladies' Cutlery Cases, Toilette Cases, Scissors, Ivory and Common Table Cutlery of all descriptions, Butcher Knives, Steels, Cheese Scoops, and Nut Picks.

A cable dispatch received in this city to-day states that metals are advancing in England. Coil Chain and English Hardware generally are firm in price. Wostenholm's Pocket Cutlery is now held at $8·50 to £, gold, and 5 per cent. added.

The semi-annual meeting of the National Association of Nail Manufacturers is at present in session in Philadelphia. It is not expected that prices will be considered by the convention, although it is expected that the action of the iron manufacturers, at their meeting in the same place to-day, will foreshadow to some extent the future price of Nails. We quote Nails at $5 rates net for 10d. to 60d., and have no doubt that for large lots a better figure would be named. The card rate, viz., $5·50, is still the nominal price.

Fernald & Sise are now the agents of Plumb, Burdict & Barnard, of Buffalo, N. Y., manufacturers of Coach Screws, Carriage, Tire and Machine Bolts, and will keep a full line of these goods in stock. They also control Young's Small Necked Silver Glass Knob, a very neat trimming, entirely free from the objection to be found in most glass knobs (the clumsy appearance of the neck) which in this instance is completely overcome.

Luther Boardman & Son quote their Spoons and Forks as follows:

Plated Nickel Silver Spoons, Forks, &c	dis 33⅓ %
Superior 18 per cent. Nickel Silver Goods	dis 5 %
Britannia Spoons, First Quality	dis 25 %
Britannia Spoons, Second Quality	dis 25 %
Plated Franconia Spoons	dis 25 %
Cheap Metal Spoons, Buffed	dis 25 %

For some time past we have quoted the market for Carriage Bolts weak. To-day we alter our quotations for Common Carriage and Tire Bolts to discount 60 and 20 per cent., and Norway Iron do., discount 50 and 10 per cent., formerly 50 and 10 to 60 per cent. and 45 per cent., respectively. Although manufacturers of better class of Bolts have not yet altered their prices, still it is proper to state that concessions are expected before long.

Referring to our mention last week of dividends paid by the American Screw Company on their capital of one million two hundred thousand dollars, it should be said that this capital is only nominal. The stock never has been watered, and the real capital includes the accumulations of nearly forty years, and is estimated at from eight to ten millions of dollars.

IRON.

American Pig.—Some movement has been reported in contracts the past week, though the season is not expected to be thoroughly commenced before the middle of the month. Makers, as a rule, are very firm in their views, and in some cases refuse to name figures. For a lot of 2000 tons, No. 2, delivered at Hoboken, 500 tons a month, $45 was asked, which indicates that there will be a decided effort to force prices up, and in several other cases $45 has been refused for No. 1 delivered ahead. Spot lots, however, can be obtained in any quantity on a basis of $45 for No. 1, and $43 @ $44 for No. 2. A contract is reported of 15,000 or 25,000 tons Glendon Forge at $40, and generally credited, and also several thousand tons Allentown and Crane at $45 for No. 1, and $44 for No. 2.

Scotch Pig.—The market is excessively dull for Scotch Iron, and few, if any, sales have been effected the past week to consumers. The late arrivals have all been picked up by speculators, who are storing their stocks and holding for higher figures. Quotations, in the present condition of the market, are entirely nominal, though given as follows: Coltness and Gartsherrie, $55; Gengarnock, $50 @ $52; and Eglinton, $48 @ $49.

Following are the prices of Scotch Pig Iron in Glasgow, as reported by Messrs. J. E. SWAN & BRO., under date of Dec. 20:

GLASGOW BRANDS.

	No. 1	No. 3	No. 4
Gartsherrie	137/6	117/6	....
Coltness	137/6	117/6	....
Summerlee	130/	119/	117/6
Langloan	†137/6	117/6	....
Govan	120/	115/	115/
Calder	*140/	120/	....
Shotts, Bessemer	160/	155/	....
do Ordinary	130/	115/	....
Carnbroe	125/	115/	120/
Wishaw	....	....	....
Monkland	120/	115/	....
Chapelhall	130/	115/	....
Clyde	120/	116/	....
Quarter—Clyde	120/	116/	117/6

Glasgow Warrants 3-5, No. 1; 2-5, No. 3, g. m. b. 114/6.
*f. o. b. Glasgow, 1/ per ton, extra.
† " " " 6d. " " "

WEST COAST BRANDS—*f. o. b. Ardrossan.*

Glengarnock, Ardeer	Branded Eglinton.	125/	115/	....
Eglinton, Lugar, Muirkirk, Portland		120/	115/	119/
Dalmellington		120/	115/	112/6

CURRENT RATES OF FREIGHT ON PIG IRON.

To	From Glasgow.	From Ardrossan.
New York	15/	10/
Boston	20/	12/6
New Orleans	12/6	9/
Baltimore	20/	20/
Philadelphia	20/	15/
Providence	20/	15/

Bar.—Refined Bar from store continues quiet, the difficulty of moving goods still adding to the natural dullness of the season. Prices, however, are held very strong at fully late figures.

Old Rails.—Holders are very strong at a decided advance. Advices from abroad report higher figures and a firm market. Taking present figures in England as a basis, it costs $51, gold, to lay Old Rails down at this port. The stocks here are comparatively light, and very little in transit. A sale has taken place of 300 tons at $55, and that price bid for 600 tons more, while holders are generally asking $57·50, currency.

Rails.—New English are also higher in sympathy with the advance in England, and now held at $73 @ $74, gold. American continue quiet at $80, currency, from the mills.

Scrap.—The demand continues light, but prices, though somewhat nominal, are held higher, at, say, $50 from yard. The difficulty of handling goods makes it almost impossible to sell from the wharf, and the fact that there are very few good lots out of yard makes dock prices somewhat uncertain. We quote, nominally, about $43 @ $45.

METALS.

Copper.—There has been an active demand for Ingot Copper the past week at steadily advancing prices. Advices by cable report the English market as excited and fully £5 per ton higher than at the date of our last review. The transactions in domestic Copper foot up 600,000 lbs. Lake, at 34c., cash, and 35c. January to March delivery, and 200,000 lbs. Baltimore Copper, at 33c., cash. English Copper has also been in good request, and the price at the close is held very strong at 30½c., on the spot and to arrive. Sales include 450,000 lbs. Best Selected at 30c. @ 30½c. Manufactured Copper is firmly held at old prices, no advance as yet having been resolved upon. We quote: New Sheathing at 45c.; Bolts and Braziers, 45c.; Bronze and Yellow Metal Sheathing, 27c.; and Yellow Metal Bolts, 30c., cash.

Tin.—The transactions in Pig have been limited, but holders generally are firm in their views, and at the close are asking a trifle advance. Sales include about 550 slabs Straits, at 31c. @ 31½c., and 5 tons English, at 31¾c., both gold. We quote: Straits, 31c @ 31½c.; English, 31¾ @ 32c.; and Banca, 36½c., all gold prices. Tin Plates are higher in sympathy with an advance abroad to 43/ for Charcoal Tin. The transactions the past week have been large, but mostly for forward delivery, purchasers being generally of the opinion that still higher prices will prevail, and are consequently providing for future use. We quote, at the close, Charcoal Tin, $11 @ 11·50; Coke Tin, $10 @ $10·25; Coke Terne, $8·50 @ $9; and Charcoal Terne, $10 @ $10·25.

Lead.—There has been an improved inquiry for Pig, and sales effected of some 200 tons ordinary foreign at 6⅜ @ 6½ cents, gold. Manufactured Lead continues steady at 9½c. for Bar, 10½c. for Sheet and Pipe, and 16½c. for Tin Lined Pipe, less the usual discount to the trade.

Spelter and Zinc.—The demand for Spelter is quite limited again, and prices are scarcely so firm as at our last. We quote Silesian at $6·80 @ $6·87½, gold, and only hear of sales of a few small lots at the inside price. Sheet Zinc continues steady at 10c. @ 10½c. from store. Sales have been made of 100 casks, Mosselmann, from the hands of the agents, at 9½c., less 4 per cent., gold.

Antimony.—Prices nominal, at 14¼c. @ 14½c., gold.

The following is the review of the metal market, specially prepared for *The Iron Age*, by Messrs. THOMAS J. POPE & BRO.:

We have to record quiet markets as far as regards consumption, but active speculatively. Stocks are generally light, and prices tending upward. The season is likely to be very marked for its speculative tendencies, and will require especial care on the part of the legitimate buyer. Gold rules steady at about 12 per cent.; but as the imports of the past year exceed those of all past years, without corresponding increase in exports, there may be possibilities of higher rates later in the season. Money

works easier, but we do not look for a very easy market at present.

INGOT COPPER.—Lake is cornered, and the operators talk of forcing up prices to 40c. To-day, 34½c. and 35c., prompt cash, have been paid. Stock asserted to be very light—not equal to an eight weeks' consumption. English Copper is attracting some attention.

AMERICAN PIG IRON.—Inquiry considerable, but except in Forge at $35 to $40, little business done. No. 1 quotable at $43 to $46; No. 2, nominal.

SCOTCH PIG IRON.—Labor and its strikes have caused advances in Europe, and while the production is sensibly diminished, a large falling off of English consumption is noticeable. In the end it will react favorably to the iron industry of the United States by removing, to a certain extent, the competition of English iron, and tax our industry—if it be true to itself—to the utmost.

SPELTER—Dull and nominal.

LEAD—Steady. We quote 6⅝c. to 7½c., gold.

TIN—Has risen to 32 @ 32½c., gold, under a speculative demand. Stocks in the United States, and to arrive, very heavy. Orders are being asked for shipments of Australian Tin. It is calculated that the Tin Ores of Lake Superior will be ready for shipment on the opening of navigation.

ANTIMONY—Dull and nominal.

PITTSBURGH.

JAN. 4, 1873.—The Pig Iron trade opens auspiciously for the new year, and we are in hopes that the stagnation which prevailed during the last three or four months of the old year is to be succeeded by a season of activity, and the indications at this writing are that our expectations will be fully realized. There has been a largely increased demand within the last two weeks for both mill and foundry irons, occasioned, to some extent, by the feeling that prices have touched bottom, and the result is a firmer market, though there is no quotable change in prices. Many of the Western producers—we refer to those in the Shenango and Mahoning Valleys—have got their ideas up in consequence of the improved demand, but there are others who are willing to meet buyers at present prices. Forty dollars, four months, seems to be regarded as the ruling price for good red short irons, several round lots having been sold at that figure, but some producers are asking from $42 to $45, and refuse to sell for less. It is claimed that in view of the fact that there has been no reduction in the cost of ore, coal and labor, that the margin at $40 is very small, but at present there are no buyers above it, and some manufacturers are still inclined to hold off in expectation of being able to stock up at lower prices. As already stated, however, the feeling seems to be generally entertained that the bottom has been touched, and this inspires the belief that trade is destined to improve, as stocks in the hands of consumers are very much reduced, and if money would ease up, of which the indications are favorable, there is reason to believe that buyers generally would feel like stocking up.

Manufacturers complain that orders for finished irons are coming in very slowly, and this, as might be expected, has a tendency to restrict the demand for metal; however, stocks are reported very light in the West, and it is probable that orders will commence to flow in pretty freely within the next few week.

The steel mills are all in full blast, and some of them are unable to catch up with their orders. The past year has been one of unusual prosperity in the steel trade of Pittsburgh, and the indications are that 1873 will be fully as good, if not better.

The *Commercial* of to-day reports: We are unable to report any material change in the market for Pig Iron. The demand for good brands of red short iron has been active. We could have reported larger sales were it not for the fact that makers of good iron made from pure Lake Superior and Missouri ores are holding for higher prices, and are unwilling to sell for less than $43 to $45, delivered here. We are reported the following sales:

BITUMINOUS COAL SMELTED FROM LAKE SUPERIOR ORE.

1,000 tons gray forge	$40 00—4 m.
700 tons gray forge	40 00—4 m.
400 tons gray forge	40 00—4 m.
200 tons gray forge	40 00—4 m.
200 tons gray forge	40 00—4 m.
200 tons gray forge	40 00—4 m.
300 tons open gray at furnace	40 00—4 m.
300 tons close gray red short from yd.	40 00—4 m.
300 tons gray forge	40 00—4 m.
300 tons close gray	38 00—4 m.
700 tons open gray forge red short	40 00—4 m.
300 tons open gray forge red short	40 00—4 m.
400 tons open gray forge red short	40 00—4 m.
500 tons close gray medium	38 00—4 m.
450 tons white and mottled	35 00—cash
100 tons silvery foundry	40 00—5 m.
30 tons forge	40 00—4 m.
10 tons silvery	41 00—4 m.

ANTHRACITE.

200 tons gray forge	$40 00—4 m.
500 tons mottled cold short	37 00—4 m.
350 tons gray and mottled red short	38 00—4 m.
200 tons white	36 00—4 m.
200 tons No. 2 foundry	41 00—4 m.
200 tons extra forge	41 00—5 m.
100 tons mottled red short	38 00—4 m.
100 tons No. 2 foundry	42 00—5 m.
50 tons No. 1 foundry	44 50—4 m.
30 tons No. 3 foundry	40 00—4 m.
30 tons No. 1 foundry	46 00—4 m.
10 tons No. 2 foundry	44 00—4 m.
50 tons No. 2 foundry	42 00—4 m.
30 tons No. 2 foundry	44 00—4 m.
20 tons No. 1 foundry	48 00—4 m.

COONELLSVILLE COKE.

500 tons Dunbar No. 2 foundry	$42 00—4 m.
500 tons Dunbar No. 1 foundry	44 00—4 m.
200 tons Dunbar No. 1 foundry	45 00—4 m.

BOSTON.

JAN. 4.—The Iron market is quiet, and comparatively little has been done the past week. Mail advices from England confirm the cable reports of an advance of from 15/ to £1 per ton for Refined Bar Iron. In the Boston market prices remain unchanged, but are firmer than before the advance abroad. So far as we can learn, very few orders have been sent out for Bar Iron during the time in which low rates have ruled, nor has the advance induced the placing of orders on American account to any extent. English sellers talk of still further advances, but it is difficult to predict the future course of the market. Scotch Pig is firmer under advices of an upward tendency abroad. The demand for both American and Scotch Pig is light, but an improved demand is looked for in a few weeks. Reports from Pennsylvania speak of a dull market, with very heavy accumulations of Pig Iron. The holders are quite firm, however, and with the assistance of the banks, are likely, as a rule, to be able to carry their stocks until the demand increases. Sheet and Galvanized Iron are quiet, and sell at last quotations. We quote yard lots of American at $55 to $58 per ton, including No. 2 extra at $55, and No. 1 at $58. Scotch is held firmly. We quote Eglinton at $52, Coltness at $58 to $59, Gartsherrie at $58 to $59. American and English Bar are selling fairly at $105 to $107·50 per ton for the ordinary sizes, and $125 to $150 for extra sizes, according to size. Cast Steel is selling at 16c. for English, gold, and 16c. to 18c. for American, currency. Anchors are selling at 8½c. per lb.; Chain Cables (⅝ to 2 inches thick), 7c. to 8¾c. per lb.; Coil Chains, 7½c. to 16c. from 3-16 to 1¼ inches. Boiler Plates remain steady. We quote at 8¼c. for Flanges, 6¼c. for C No. 1, and 6c. per pound for Common and Tank. Russia Sheet is steady at 18c. to 19c., gold, and 22c., currency, for perfect lots. English and American do. are very firm, and selling at 7¼c. to 9c. per lb., currency. Galvanized Sheet Iron remains steady and active at unchanged prices. We quote No. 20 at 12c.; Nos. 21 to 24, 13c.; 25 and 26, 14c.; 27, 15c.; 28, 16c. Nails are in fair demand, with sales at $5·50 for 10d. to 60d., and other sizes at a range of $6 to $8 per 100 pounds.—*Com. Bulletin.*

SAN FRANCISCO.

DEC. 27.—*Hardware*—Trade is easing off considerably, as is usual during the holiday season. Stocks are, however, moderate, and prices steady. *Metals*—There is no movement. Business, as is usual during the holidays, very slack. Supplies accumulate, and prices of Scotch Pig and other irons are entirely nominal. Cable telegrams of an important rise of price in Great Britain have no response here at this season of the year. Our quotations are largely nominal—say, Pig Iron, $50 to $52·50; Braziers' Copper, 35c. to 38c.; Bar Iron, 4c. to 5¼c.; Boiler Iron, 5c. to 6c.; Plate, 6¼c. to 6⅝c.; Sheet, 6c. to 8c.; Tin Plate—I. C. Charcoal, 10x14, $13 to $13·50; do. I. X., 10x14, $15 to $15·50; Roofing Plate I. C. Charcoal, $13 to $13·50; Banca Tin Slabs, 40c. to 42c.; Zinc Sheet, 9c. to 10c.; Cast Steel, English, 16c. to 17c.; Lead, Pig, 5¾c. to 6c.; do. Sheet, 9c.; do. Pipe, 8¼c.; do. Bar, 6¼c. At auction, 12,000 lbs. old Yellow Sheathing sold at $12·05 per 100 lbs. *Nails*—Imports from January 1st to December 16th: Kegs, 216,752. There is no demand from the trade. Dealers fully supplied. The last sales, ex ship, were at $5·25 for invoice parcels. For the present the standard jobbing price is continued, $6 for 10d. to 60d.; 8d. and. 9d., 25c. per keg above 10d.; 6d. and 7d., 50c. do. do. 10d.; 4d. and 5d., 75c. do. do. 10d.; 3d., $1·50 do. do. 10d.; 2d. and 3d. fine, $2·25 do. do. 10d.; Cut Spikes, all sizes, 25c. above 10d. Thus the jobbers' range is $6 to $9.—*Com. Herald.*

CINCINNATI.

Messrs. ADDY, HULL & CO., under date of Jan. 4, write us as follows: *Pig Iron.*—Market quiet and unchanged. Foundries and mills gradually resuming work, and a better trade is anticipated.

HOT BLAST CHARCOAL.

Hanging Rock No. 1	$57·00 @	—4 mos.
" " No. 2	54·00 @ 55·00	—4 mos.
" " Forge	46·00 @	—4 mos.
Tennessee No. 1	54·00 @ 55·00	—4 mos.
" Forge	46·00 @	—4 mos.
Alabama No. 1	@	—4 mos.
Missouri No. 1	57·00 @	—4 mos.
" No. 2	55·00 @	—4 mos.
Iron Mountain No. 1	59·00 @	—4 mos.
Irondale No. 1	59·00 @	—4 mos.

COLD BLAST CHARCOAL.

Hanging Rock Car Wheel	$60·00 @ 63·00	—4 mos.
Missouri " "	60·00 @	—4 mos.
Tennessee " "	58·00 @	—4 mos.
Alabama " "	60·00 @ 63·00	—4 mos.
Monitor	63·00 @	—4 mos.
Bibb	63·00 @	—4 mos.
Shelby	63·00 @	—4 mos.
Maramee	60·00 @	—4 mos.
McKee	60·00 @	—4 mos.
Etna	60·00 @	—4 mos.

STONE COAL.

Missouri No. 1	$54·00 @ 55·00	—4 mos.
" Forge	45·00 @ 46·00	—4 mos.
Ohio No. 1	53·00 @	—4 mos.
" Forge	45·00 @	—4 mos.

CLEVELAND.

Messrs. CLEVELAND, BROWN & CO., under date of Jan. 6, write us as follows: There has been a great deal of inquiry for Iron the last few days, and orders have been placed quite freely at quoted rates, most buyers being evidently convinced that the lowest prices have been reached, and any changes that may be made in the immediate future will be toward higher prices. We herewith hand you our market prices:

BAR IRON, 4 6-10 rates.

NAILS, $5·35 rates.

SHEET, 6 7-10 for No. 24, other numbers in proportion.

GALVANIZED, 20 to 25 per cent. off list.

BALTIMORE.

Messrs. WYETH & BROTHER, Iron and Steel merchants, corner of South Charles and Lombard streets, report us the following prices, under date of Jan. 7, 1873: With the new year the iron market here, as anticipated, has stiffened up considerably, and present quotations are firm. Stocks, as a rule, are light, and assortments much broken. Trade is fair, with some good orders being received.

AMERICAN REFINED BAR IRON.

1 to 6 wide by ⅜ to 1 thick	4½c. to 4¾c. per lb.
1 to 4¾ wide by 1⅛ to 2 thick	
Round and square, ordinary sizes, from ⅜ to 2 inclusive	4¼c. to 4¾c. "
Hoop Iron, 1¼ wide and upward	5¾c. to 6 c. per lb.
Band Iron, from 1¼ to 4 in. wide	5 to 5¼c. "
Horse Shoe Iron ¾ to 1 wide by ⅜ to ½ thick	5½ to 5¾c. "
Norway Nail Rods	7¾c. to 8c. "
Black Diamond Cast Steel, Flats, Squares and Octagon, ordinary sizes	17c. "
Machinery Steel	11½c. "
Cast Spring Steel	11c. "
Homogeneous Steel Plate	13c. "
Perkins' Horse Shoes, per keg of 100 lbs.	$6·87½
" Mule Shoes " "	7·87½

Common Horse Nails, from 14c. to 18c. per pound.

10	9	8	7	6
25	26	27	28	30c. per lb.

Putnam Horse Nails. 25 26 27 28 30c. per lb.
R. R. Spikes 5¼ by 9-16 at 5¼c. per lb.

LOUISVILLE.

Mr. GEO. H. HULL, under date of Jan. 6, writes us as follows: There is more inquiry for Hot Blast Irons, but at lower figures. Sales are small in consequence of the wide difference in views of buyers and sellers. Cold Blast Metals are firm at full figures. The usual time, four months, is allowed on quotations below:

HOT BLAST CHARCOAL.

No. 1 F'dry, from Hanging Rock Ores	$57·00 @ 58·00
" 2 " " " "	52·00 @ 55·00
" 1 Forge, " " "	48·00 @ 49·00
" 1 F'dry, from Tennessee Ores	56·00 @ 57·00
" 2 " " "	52·00 @ 54·00
" 1 Forge, " "	48·00 @ 49·00
" 1 F'dry, from Alabama Ores	57·00 @ 58·00
" 1 " " Iron Mountain Ores	59·00 @ 60·00

HOT BLAST STONE COAL.

No. 1 F'dry, from Missouri Ores	56·00 @ 57·00
" 2 " " "	52·00 @ 54·00
" 1 Forge, " "	46·00 @ 47·00

COLD BLAST CHARCOAL.

Car Wheel from Hanging Rock Ores	60·00 @ 65·00
" " Tennessee Ores	59·00 @ 60·00
" " Alabama Ores	60·00 @ 62·00
" " Georgia Ores	60·00 @ 62·00
" " Missouri Ores	58·00 @ 62·00
" " Kentucky	58·00 @ 60·00

Foreign.

GREAT BRITAIN.

Messrs. J. Berger Spence & Co., London, Glasgow and Manchester, under date of Dec. 23, report:

Metals.—In this market active business operations have been continued during the week, and transactions, more especially in the iron branch, are again assuming healthy proportions. Another great advance has been made in the price of Scotch Pig Iron Warrants, quotations being now fully 10/ per ton higher than at the date of our last issue, and the shipments are again reported in excess of the corresponding week in last year. The total increase up to Dec. 14th is 25,188 tons. The demand for Middlesborough Pig Iron is fair, but makers, anticipating higher prices, are preferring to hold back rather than enter into contracts for future delivery at present rates. The same may be reported of Manufactured Iron in South Staffordshire and elsewhere. Orders are becoming more plentiful, but buyers now experience a difficulty in inducing forge masters to accept them except at advanced prices. The advices of moderate charters (1300 tons) from Chili for the first fortnight in November have favorably affected the Copper trade, and prices all round are higher, with an increasing demand for English Ingot and Manufactured. An improved feeling is noticeable in Tin, and quotations for Straits and English are advanced. Rates for Lead are fully maintained, and the high prices now obtainable for the ore of this metal induce a belief that a further rise is not improbable. Spelter is unchanged, but with bare stocks, both of English and foreign, an improvement is not unlikely.

IRON.—"Ayresome" Yorkshire Pig Iron, No. 1, 102/6; No. 2, 100/; No. 3, 95/; No. 4 (Foundry), 94/; No. 4 (Forge), 94/ net cash, or 2 extra 4 months' bill. Scotch Pig, Warrants, 114 to 115/. Staffordshire Bars, £11 to £12. Hoop Iron, £12 to £13. Gas Tubes, 20 per cent. off new list. Boiler Tubes, 5 per cent. premium.

COPPER.—Nominal. English Tough Ingot, £93. Chili Bars, £84 to £85.

TIN.—English Ingot, £144 to £145. Straits, £137 to £138.

TIN PLATES.—Best Coke, I. C., 30/ to 32/; Charcoal, I. C., 36/ to 40/ per box.

LEAD.—Best English Soft Pig, £21. 15/ to £22. Refined Red Lead, £24 to £25.

ANTIMONY.—French Star, £68 to £70.

SPELTER.—Silesian, special brands, £23. 10/. English, best brands, £24.

IMPORTATIONS.

Of Hardware, Iron, Steel and Metals into the Port of New York, for the week ending January 7, 1872:

Hardware.

Bokei Hermann & Co.
Mdse. pkgs., 7
Beam & Murray,
Mdse. pkgs., 1
Cases, 4
Vises, casks, 4
Anvils, 150
Bodenheim, Meyer & Co.
Mdse. pkgs., 3
Brantigam & Watson,
Wire, cases, 2
Carr H. W.
Casks, 6
Cooms, Crosby & Co.
Cases, 1
Dickinson HELRY.
Cases, 6
Depo James,
Cutlery, cases, 1
Fisher J. L.
Casks, 3
Field A. & Co.
Mdse. pkgs., 12
Fredericks Robt.
Packages, 10
Folsom H. & D.
Per. caps, cases, 2
Guns, cases, 1
Hoyt, Busick & Co.
Per. caps, cases, 3
Hart Mfg. Co
Chains, cks., 8
Harmar, Hayes & Co.
Cases, 1
Lau & Garlichs,
Mdse. pkgs, 2
Mason John W. & Co.
Wire rope, coils, 1
Mulford & Sprague,
Chains, casks, 25
Page Edward & Co.
Wire, bdls., 4509
Trippett Bros.
Per. caps, cases, 8
Trost H. & Co.
Cases, 13
Von Cleff Bros.
Mdse. pkgs., 10
Van Wart & McCoy,
Cases, 3
Wiebusch F.
Mdse. pkgs., 3
Wilson D. C.
Cases, 1
Witte John G. & Bro.
Mdse. pkgs., 1
Ward Asline,
Mdse. pkgs., 2
Order.
Files, casks, 6
Cutlery, casks, 1
Wire, bdls., 118

Iron.

Brown Bros. & Co.
Scrap, tons, 88
Cooke Jay & Co.
Scrap, lots, 1
Carpenter David,
Bundles, 200
Duncan, Sherman & Co.
R. R. bars, 1315
Fish plates, bdls, 320
Danez & Mestre,
Tons, 200
Griswold J. A. & Co.
Pig, tons, 135
Hanford P. & Co.
Scrap, cks., 44; tons, 40
Kleinwort, Cohen & Co.
Scrap, tons, 54¼
Kidder, Peabody & Co.
Scrap, tons, 80
Lang W. Bailey & Co.
Crank pins, 48
Osborne J., Son & Co.
Scrap, kilos, 2500
Page Edward & Co.
Bars, 4863
Richards D. W. & Co.
Scrap tons, 210; pkgs, 10
Sampson Bros.
Bars, 2433
Vatable H. A. & Son,
Scrap, tons, 120
Vose, Dinsmore & Co.
Rails, 1145
Wheeler A. & Co.
Rods, bdls., 394
Whitney A. R.
Bundles, 90
Wenberg B. J.
Scrap, tons, 10
Whitney C. W.
Bars, 1482
Bundles, 11
Order.
Bars, 7008
Spiegle, lots, 1
Rails, 3844; pcs, 2214
Pig, tons, 800
R. R. bars, 5446
Scrap, tons, 70
Old rails, pcs., 2563; lots, 1
Without bills of lading.
Pig, tons, 190
Bundles, 1787
Bars, 683

Steel.

Abbott & Howard,
Cases, 19
Champen H.
Rails, 1081
Cockayne J. W.
Bundles, 171
Eagleton Mfg. Co.
Bundles, 405
Kiden, Nordenfelt & Co.
Rails, 1189
Moss F. W.
Cases, 2
Bundles, 107
Casks, 11
Naylor & Co.
Mdse. pkgs., 211
Bar, cases, 11
Tires, 77
Piersons & Co.
Bundles, 278
Slagg Joseph,
Mdse. pkgs., 118
Vose, Dinsmore & Co.
Mdse. pkgs., 14
Van Wart & McCoy,
Mdse. pkgs., 748
Wilder E.
Cases, 10
Wardlow W. C.
Mdse. pkgs., 319
Order.
Bundles, 398
Cases, 4
Spring, cks., 10
Without bills of lading.
Bundles, 392
Cases, 14

Metals.

Bruce & Cook,
Tin plates, bxs. 72
Lead, cks., 18
Benedict & Burnham Mfg Co.
Spelter, plates, 1365
Baring Bros. & Co.
Lead, pigs, 970
Brown Bros. & Co.
Copper, bbls., 8935
Echeverria M. & Co.
Copper, bxs., 7
Figuera J.
Lead, pigs, 3300
Goodwin & Rice,
Tin plates, bxs., 290
Lanman & Kemp,
Tin slabs, 334
Meissner, Ackerman & Co.
Spelter, plates, 10,262
Murray R. J.
Yellow metal, lbs, 600
Phelps, Dodge & Co.
Tin plates, bxs., 4307
Richards D. W. & Co.
Scrap copper, pkgs., 37
Scrap lead, pkgs., 120
Vatable H. A. & Son,
Scrap, bbls, 7
Wenberg B. J.
Yellow metal, cs., 2
Lead, cases, 1
Order.
Lead, pigs, 12,210; pcs., 1090
Tea lead, pkgs., 59
Tin slabs, 1469
Spelter, plates, 25,529
Black lead, casks, 107
Tin and terne plates, bxs., 8252

I. Mamroth's Prussian Metal Review.

(Translated for The Iron Age.)

BERLIN, Dec. 14, 1872.—METALS—Business in metals has continued under sway of circumstances hitherto explained, and has moved rather slowly. There has been but a limited inquiry for Silesian Pig Iron, and Coke has established at 4 ⅜ thalers, and Charcoal at 5 @ 5 1-6 thalers at the works. The trade in Scotch Pig has been restricted within narrow limits, and favorite brands have been quoted here 5 ⅜ @ 5 ⅝ thalers the 100 kilos. Nor has English Pig attracted any greater interest, and larger lots were obtainable at 4½ thalers. There is no essential change in materials: Parcel and scrap iron, 4½ @ 5; smelting, 3 1-6; cast, 4 @ 4 11-12; and old rails for rolling purposes were offered at the last government tender at Hanover at 4 1-6 @ 6 5-12. Rolling mill manufactures have remained steady: Raw rails, 8 ⅓ thalers; rolling iron, 12; sheet iron, 18 @ 18¼; and forging, 14; all deliverable at the Upper Silesian mines. *Copper* is quiet; English, 59 @ 62 thalers, and prime brands Chilian 1 thaler the 100 kilos higher. *Tin*—Consumers thereof have been keeping aloof, and Lamb has been done 4 @ 5 thalers lower. *Spelter*—The ordinary union brands went with light dealings at 14 5-6 thalers, and Giesche's Heirs at 15 5-6. *Lead*—Unalterably firm. *Coal* was in good demand; Upper Silesian block coal 5 @ 7⅓ silbergroschen the 50 kilos.

Our Metal Imports.

A summary statement, from returns of collectors of customs, of foreign metals and metal goods imported into the United States during the 12 months ending June 30, 1872, 1871 and 1870, declared quantities and values.

COMMODITIES.	QUANTITIES. 1872.	1871.	1870.	VALUES. 1872.	1871.	1870.
IRON & STEEL, & MANUFACTURES OF						
Pig iron lbs.	554,165,164	409,031,453	343,354,457	5,122,318	3,106,490	509,280
Castings lbs.	866,285	4,406,073	866,653	34,333	32,679	20,297
Bar iron lbs.	236,454,061	203,508,135	158,361,318	5,153,472	4,058,130	3,156,236
Boiler iron lbs.	1,401,951	1,098,838	1,974,603	57,372	31,284	50,968
Band, hoop and scroll iron lbs.	2?,416,191	22,441,122	13,536,425	537,457	506,497	280,665
Railroad bars and rails lbs.	944,739,393	1,026,045,340	626,675,610	15,778,941	17,530,297	9,669,571
Sheet iron lbs	29,509,065	20,977,572	26,419,209	1,116,200	610,869	991,655
Old and scrap iron tons.	236,662	155,805	148,586	6,040,678	3,752,526	3,171,331
Hardware	....	....	....	204,992	141,495	203,021
Anchors, cable and chains of all kinds lbs.	11,010,613	11,049,539	11,248,677	490,275	472,782	452,177
Machinery	....	....	....	1,054,045	907,371	914,008
Muskets, pistols, rifles and sporting guns	....	....	...	711,858	706,988	620,185
Steel ingots, bars, sheets and wire	....	....	....	4,023,508	3,750,702	2,342,408
Railroad bars, or rails of steel lbs.	245,911,554	....	....	6,277,094	....	....
Cutlery	....	....	....	2,142,708	1,956,351	1,695,238
Files	....	....	....	583,058	604,153	553,581
Saws and tools	....	....	....	542,377	514,346	212,861
Manufactures of iron and steel not specified	....	....	....	5,621,882	4,883,075	5,821,862
COPPER:						
Ore cwts.	27,110	22,344	100,313	85,622	41,007	171,976
Copper, all unmanufactured lbs.	5,106,330	691,428	237,067	1,040,458	82,070	28,116
Manufactures of	....	....	....	800,478	628,675	456,165
TIN, AND MANUFACTURES OF:						
In bars, blocks or pigs cwts.	110,856	116,594	73,255	3,418,042	3,093,355	1,984,238
In plates cwts.	1,75?,667	1,608,002	1,347,614	2,312,428	3,598,100	7,608,228
Manufactures of	....	....	....	79,233	65,760	58,622
LEAD, AND MANUFACTURES OF:						
Pigs, bars, and old lbs.	83,604,698	92,636,087	88,419,323	3,369,075	3,711,785	3,644,404
Manufactures of	....	....	....	26,015	13,761	30,584
ZINC, SPELTER, OR TEUTENEGUE, & MANUFACTURES OF:						
In blocks or pigs lbs.	12,683,411	11,389,537	8,425,461	565,739	490,982	384,767
In sheet lbs.	14,580,107	7,164,035	11,548,359	820,879	358,459	618,665
Brass, and manufactures of	....	....	....	173,515	129,094	160,272

The Ceylon Plumbago Market.

(Britton, Aitken & Co.'s Review—Condensed for The Iron Age.)

COLOMBO, Ceylon, Nov. 14, 1872.—*Plumbago*—The demand for this metal is considerably in excess of the supply, and prices are rising. We quote as follows: Lump, per ton, £24 to £25; chip, £11 to £12; dust, £6 to £7. *Exchange*—One per cent. discount to par for credits, and one to two per cent. for documentary bills; 6 months bank, half per cent. premium.

P. S.—*Iron*—Quotations this day: Hoop, 1, 1⅛, 1¼, 1½, gauge 17, £18 per ton; 1¾, 2, 2¼, 2½, gauge 12, £22 per ton.

Latest East India and Dutch Tin Telegrams.

(Private despatches communicated to The Iron Age.)

BATAVIA, Dec. 9, 1872.—Billiton *Tin*—Sale average, 82¾ guilders.

SINGAPORE, Dec. 11, 1872.—*Tin*, 832·12. Exchange, 4 5½.

PENANG, Dec. 11, 1872.—*Tin*, 832·25. Exchange, 4 5⅝.

AMSTERDAM, January 1, 1873.—*Tin*—Quiet, with downward tendency.

Vienna Exhibition Notes.

(Translated for The Iron Age, from the Borsenhalle.)

VIENNA, Dec. 12, 1872.—In the main building of the exhibition, especially in the industrial palace and hall of engines, each nation has a separate space assigned to it. The distribution has been based upon the plan of traversing from East to West, and *vice versa*, the territories of the various nations in the same progression as their countries follow each other on earth. At the right wing of the exhibition the Asiatic nations will open the line, and the United States and other American nations will close the same. Next to Asia will come Russia and Austria, and the United States will be reached through England and France. Germany will be centrally located both in the industrial palace and the hall of engines, to the right hand side of Austria and to the left of the smaller States of Northern and Western Europe. The only exception from this arrangement the cupola will form, within whose vast expanse a number of select productions from all countries will be displayed indiscriminately, distinguished not only by intrinsic value, but by real beauty and perfection. The portion assigned to Germany alone, and in which the exhibition of fine arts is not comprised, will embrace 32,000 square metres, inclusive of passages. Thus Germany will have 1000 square metres within the cupola, 7700 within the galleries, 10,000 in the additional German structures, 9000 in the hall of engines, 2500 in the hall of agricultural implements and machines, 1500 in the hall assigned to groups 2 and 4. The whole German department will be twice as large as had been allowed to the German States at Paris, in 1867. Within the cupola no nation will have a separate space assigned to it, so far as we have reason to believe. On the contrary, without distinction of origin, the whole is to be arranged in such a manner as to produce the finest effect as a whole, while permitting each individual object to be displayed to full advantage. The German additional structures will have allotted to "mining industry" 2400 square metres, and in the midst of these representatives of iron and other metals Frederick Krupp will have a little pavillion made of iron, containing his manufactures.

Alexander Duff & Co.'s Mauritius Metal and Coal Report.

(Extracted for The Iron Age.)

MAURITIUS, Nov. 14, 1872.—*Tin Plates*—Are steady at $12·50 to $13 per case, I. C. *Galvanized Iron*—$10 to $12 per 100 pounds. *Coals* are quiet at $10 to $12 per ton.

I. Peet & Co.'s Batavia Tin and Coal Report.

(Condensed for The Iron Age.)

BATAVIA, Java, Nov. 9, 1872.—*Tin*—Billiton. Average at the last auction, 7th instant, 92·01 guilders per picul; the next sale will take place on the 7th proximo. Tin shipments to the United States since the 9th ultimo per "Competitor" 100 tons, and per "Ned en Oranje" 7 tons, together 107; previously this year 69½, together 176½ tons. *Coals* have improved, and the improvement is likely to be maintained. English have been sold at 24 guilders per ton, cash, alongside, and Australian at 20.

Rautenberg, Schmidt & Co.'s Singapore Iron, Tin and Coal Report.

(Translated for The Iron Age.)

SINGAPORE, Nov. 7, 1872.—*Iron* is more quiet and prices are nominally weaker. No sales reported. *Tin* has been dull, and but few sales are reported at $35⅝ to $35¾ per picul, which is equal to £146. 9 8 to £146. 19 8 per ton, cost and freight. *Coals.* Cardiff are in good request, but nothing is offering of them; other sorts are neglected. Thus a cargo of West-Hartlepool coal is offered at $10, with three months credit, without meeting with a purchaser. Of the latter kind 700 tons sold at $8½, three months, and 300 tons Scotch at $7¼, "landed."

Rotterdam Tin Market.

(Translated for The Iron Age from the "Nederlandsche Courant."")

ROTTERDAM, Dec. 10, 1872.—*Tin*—the market has remained unaltered, with trifling transactions. Banca has been done at 86½ guilders on the spot, 84½ to 83 guilders for delivery from the next spring auction, and Billiton on the spot at 83.

The French Iron Situation.

(Translated for The Iron Age from Le Commerce.)

PARIS, Dec. 19, 1872.—*Iron*—France is passing through a period of political agitation at present little calculated to facilitate commercial dealings. The continual uncertainty in this respect, joined to a season little favorable to metallurgical industry, has for the moment almost brought to a stand-still all demand for goods, leaving the French iron masters full leisure to attend to the filling of previous orders that have been accumulating upon their hands. The orders appearing at this center once in a while are nearly all for reassortments. Prices here, on the whole, are lower than at the works, where large commands had been taken from Paris houses at the old low prices, thus enabling the Parisians to beat the works in their own markets. In the Champagne great quiet prevails. The Northern works are in the same plight. Dunkirk is importing Scotch pig iron. In Belgium iron has also declined, though not much.

The Chilian Copper Market.

(H. Fischer & Co.'s Review, translated for The Iron Age.)

VALPARAISO, Nov. 29, 1872.—*Copper in bars* is in good request, owing to more favorable accounts from England, at $18, cash, on shore here. Ere the mail arrived, 150 tons favorite brands were sold on the coast at the same figure, free on board; since when 300 tons Lota sold at the same price, and for Guagacan Copper $18½ is now asked. Of *Regulus*, a cargo already on board was taken with a freight of £2. 2 6d already secured at $8¼, but for another cargo, no more than $8 could be paid by the purchaser, freight having risen to £3 in the interim. No sales have been effected of *Copper Ore.* Total sales during the fortnight, 14,445 quintals of Copper in bars, and 30,000 quintals of Regulus. The following are the closing quotations to-day: *Bars.*—Urmeneta, with 50/ freight per steam, $18·50, cash, on board asked; $18·35 offered. Lota, $18, with sales; extra brands, $18·25 offered. *Regulus*, 50 per cent., $8 per quintal, *f. o. b.*, with sales. *Ore*, 25 per cent., $3·20 to $3·40, nominally. *Freight.* But few vessels have arrived, and there being a brisk demand for them, freights have become remarkably firm. *Copper Freights* to England, £3; to New York, with Nitrate, £3. 5/; *Exchange*, 60 days on London, 45⅛d to 45½d; 90 days 45½ to 45⅝d.

OUR ENGLISH LETTER.

Review of the British Iron, Steel and Hardware Trades.

(From our Regular Correspondent.)

SHEFFIELD, Dec. 12, 1872.

My last week's communication will, to a certain extent, have prepared you for the announcement I have now to make, which is, that there is a decided tendency toward higher prices throughout all the great ironmaking districts of this country. A variety of causes have combined to bring about this result. The more potent of these are, without doubt, the substantial reduction in the Bank rate of discount; the great decrease in the principal stores of pig iron; the extreme firmness of the coal owners, and, lastly, a slight—and for anything we know at present, temporary—revival of the heavier branches of trade. During the last four months the activity which had up to that time characterized the iron trade has very sensibly and materially diminished, mainly owing to the high prices of fuel and the retention of good orders by merchants, who waited for lower quotations and refused to give out any instructions until reduced figures were reached. The sequence is not difficult to trace. Lower prices were quoted, to the extent of which you have been from time to time advised; the merchants, factors and others have now given out some good orders, and, as a necessary consequence, prices are again "going up." Whether this reaction will be well sustained or will prove a mere temporary revulsion, is yet a matter for speculative conjecture. It would not, I opine, be a very difficult undertaking for myself, or anyone else, to pile up a mass of statistics demonstrating the fact that iron *must* again go up to fabulous prices, seeing that all the world requires more iron, more steel, more hardware of all kinds every year, and that it is England's destiny—her appointed mission—to

supply the world's requirements. My space and your convictions forbid this, however, and we must be content to take the bare facts as they present themselves to us. A great deal of business has been done during the four months of which I have spoken, at the very lowest possible margin of profit to the manufacturer, who has been glad to carry out orders for the mere keeping of the connection together—and has in more than one instance done so at a pecuniary sacrifice, bearing in mind the fact that labor has not fallen and that the raw material has suffered no sensible reduction. For this sacrifice they will naturally endeavor to recoup themselves at an early date, and the renewed activity consequent upon the causes mentioned and the approach of Christmas would appear to afford the desired opportunity.

Following the lead of the Staffordshire coal owners, the Yorkshire, Derbyshire, Durham Coke Association met at Sheffield last week, and decided not to make any reduction in price. This action is fully endorsed by the colliery proprietors, so that it now remains to be seen if the steel manufacturers will put into execution the threatened closing of the works two days or so per week. For my own part—and knowing what I do of the position and prospects of the trade—I do not think they will do so. Many premises lead to this conclusion, not the least important of them being the trades union opposition to the adoption of so extreme a measure. *Nous verrons.* The coal trade generally is in a fairly prosperous state, and the men are working pretty evenly, except in Wales and some parts of Scotland. In Monmouthshire and Glamorganshire the colliers are in a state of high dissatisfaction, and are resolved upon striking unless the masters' notice of an intended reduction be at once rescinded. They are working as little as possible, so as to prevent the masters having any considerable stock to fall back upon in the event of a strike ensuing. In Scotland, at Hamilton, a miners' delegate meeting, representing about 30,000 men, was held last week, at which Mr. McDonald, President of the National Miners' Association, delivered a vigorous speech, vindicating the course to be taken by the miners in the coming struggle. Resolutions were unanimously passed declaring determined opposition to the proposed reduction of 2/ per day in the men's wages, and levying 2/ per man to fight the question, should it eventuate in a struggle. Mr. McDonald took the opportunity of ridiculing the "Heathen Chinee," the probability of whose introduction had been alluded to, describing them as "miserable worn-out Asiatics who had been kicked out of Massachusetts, would be kicked out of the Pacific, and emphatically so here if they were introduced into this country." I may say in passing, that I believe *they would* be kicked out—and pretty vigorously. A new coal field is to be opened out shortly at Worsborough, in the already busy South Yorkshire district, where the Barrow-in-Furness Iron & Steel Company have just bought 900 acres of coal, and have an expressed intention of taking more. This new field works the Barnsley "Top Hard" seam, containing millions of tons of coal. The trial sinkings at Sandwell, near Birmingham, have assumed a more encouraging phase, coal bearing strata (white sandstone and fireclay) having now been encountered at a great depth, but no doubt to the unutterable consolation of those whose £16,000 are concerned. At a place bearing the misnomer of the "Cape of Good Hope," near Bridgnorth, a seam of coal some five feet in thickness has been discovered and is being worked, and at Trench, near the Duke of Sutherland's Lilleshall estates, a trial boring is being made through the Permians—I need not specify to your geological readers at how great a depth. These items will, I think, suffice to show you the great and eager activity existing in this country on these and kindred matters. No sooner is it clearly and unmistakably shown that coal working will pay, than engineers, surveyors and everybody else, get prospecting, and soon new collieries spring up in all directions—often where nobody had ever dreamed that the precious mineral existed.

The Sheffield steel trade is in a fairly prosperous condition, but it is evident that either steel must shortly be advanced or coal and coke must be reduced. Several large firms are paying £40,000 a year more for these latter articles than they were two years ago, and if the burden continues to be imposed some legitimate means of recompense must be resorted to. At present all the large firms are moderately busy, and in one or two cases much activity prevails, but my information leads me to believe that in less than six months the bulk of the Sheffield steel houses will be very poorly off for orders unless something of material importance arises in the meantime. Good lots of sheet, spring, rod and tool steel continue to be sent across the Atlantic by the houses who have acquired a good business in the States—such as Moss & Gambles, Firths, Geo. Fisher & Co., Jessops & Sons, Sandersons, Wardlows, and a few others. Messrs. Osborne & Company also do a good business, I am informed, in the peculiar kind of steel made by them, and of which they are the sole makers in Sheffield.

The Glasgow pig iron market has gone up 7/ or 8/ since my last, and warrants are now quoted at 109/6. Whether these are *bona fide* figures is very much open to question; indeed, I shall not be surprised to see them decline some five or six shillings before I next have occasion to write you. I would advise your manufacturers not to accept the price of Scotch pig as any reliable criterion of the general tendency of the British markets, but would recommend them rather to look carefully through the quotations which I am enabled to give every week, and so form their own judgment from *data* which are carefully obtained, and, in the main, uniformly reliable. These are ruling rates for the principal Scotch brands of pig:

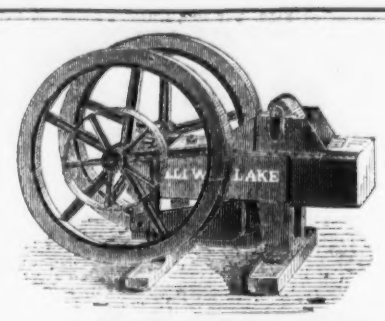
	No. 1.	No. 3.
Gartsherrie	125/0	102/6
Coltness	125/0	102/6
Summerlee	120/0	105/0
Carnbroe	110/0	98/0
Langloan	125/0	100/0
Calder	125/0	95/0
Glengarnock	112/6	98/0 to 100/0
Eglinton	107/6	97/6
Dalmellington	107/6	97/6
Carron	125/0	
Shotts	120/0	100/0
Kinneil	120/0	100/0

Shipments for the week show a slight increase, and seem to be gradually growing larger, despite the falling off of imports into Grangemouth from Middlesborough. In the latter locality, No. 1 fetches about 105/ to 106/; No. 3, 97/6 to 102/6, and No. 4, 95/ per ton, and the tone of the market is steadily firm. There are now nineteen large new blast furnaces in course of erection in the Middlesborough district, and 130 in blast out of 137 in existence. The Birmingham, Staffordshire and Worcestershire makers are holding to their full rates, and in South Wales I note an increasing inclination to demand prices which a month since would not have been insisted upon. Swedish and Russian irons are firm, but many of the Sheffield houses experience a good deal of loss and annoyance by the extremely unpunctual fulfillment of contracts by Swedish smelters. This they attribute to the great scarcity of charcoal and the bad means of transport in that country. Swedish iron is, I hardly need point out, largely used by many classes of Sheffield manufacturers—notably the file houses, and cannot well be dispensed with. Prices range very high, and vary largely, according to the brand.

In finished iron a general rise of something like 10/ per ton is being tacitly made, and is being enforced in all possible cases. The "list" houses in Staffordshire ask £12 to £12. 10/ for bars, and do not care to enter into long contracts at those rates, believing, as they do, that there will be a material advance next quarter day. Single sheets for galvanizing purposes are not readily met with under £12. 15/, and 5/ in excess of that price is beginning to be the rule. For No. 24 gauge buyers are not unwilling to give £14, and plates and angles are worth 5/ more at Wolverhampton than they were a week since. The Birmingham miscellaneous hardware trades are, as a rule, very busy, and new orders are to hand in such bulk and numbers that in many instances overtime is being resorted to, with every prospect of renewed activity in the new year. It is, nevertheless, but fair to say that the present vigor may only be a "spurt" of trade, and that nothing really definite can be taken as a basis for careful calculation until Christmas is fairly turned. The Scotch malleable iron trade does not seem yet to have become invigorated, most of the mills being employed on old contracts. In this case, also, the new year must work some material change. In the Middlesborough district rails are firm at £11, and plates at £12. 10/, with an upward inclination.

In Wales very little is doing in bars, but the larger works are fairly busy, one of them with a heavy contract for plates from Rotterdam. Cyrfarthfa is busy on rails for Galveston; Dowlais on an American order for rails; Rhymney and Tredegar for Rio de Janeiro; Ebbw Vale, rails, fastenings and miscellaneous goods for Geneva, Mollendo and New Orleans; and the Nantyglo Works with Swedish rails. Very little is reported to be doing in tin plate. In other districts the rail mills appear to be best off for orders, and expect to have their activity sustained by some good Canadian, American, Australian, Russian, English, and Brazilian specifications, a portion of which are already in the market. All the engineering works at Sheffield, Middlesboro, the Clyde, Lancashire, and elsewhere, are very fully employed, and have substantial prospects for next year. The shipbuilders on the various great rivers and estuaries are exceptionally well engaged, and continue to turn out a heavy tonnage of ocean going iron ships and smaller craft for warlike and commercial purposes. Among others, Earle's shipbuilding company, Hull, have twenty or thirty of the latter class and several of the former now on the stocks. If anything, the Clyde yards are in receipt of the fewest new orders, a fact for which I am unable to offer a reasonable explanation.

The cutlery trade of Sheffield is in the happy enjoyment of exceptional briskness—a state of things somewhat hightened by the Christmas "Bull" week, as I write. The men always work more assiduously as Christmas draws nigh, and endeavor by sheer persistence and downright hard work during fifteen or sixteen hours per day (or rather day and night) to lay up a sufficient pecuniary store to enable them to pass the great annual festive season in ease and, comparatively speaking, luxurious living. Table, pen and pocket knives, as well as razors and scissors, are greatly inquired for, but in many instances prices have been cut down to such attenuated proportions that profit is of a very ghostly, unsubstantial nature. Horns, ivory and all kinds of hafting requisites get scarcer and dearer, partly owing to the supply falling below the demand, and partly because the German and American merchants have latterly competed closely with Sheffield buyers, especially for the larger teeth. An important conference between ironmasters and ironworkers will be held at Wolverhampton next week, in order to determine the wages of the latter for the next six months, based on the average price of bars during the past six months, with 1/ bonus. Twelve and sixpence per ton is at present paid for puddling. Copper has gone up during the week, and Chili bars are now worth £3 or £4 more than they were last week. There is also an improved demand for English ingot and manufactured. The stock at Valparaiso is understood to be 4200 tons, the last charters telegraphed thence amounting to 800 tons bars and 400 tons ore and regulus. Straits tin has gone up to £135 for prompt cash. There is no alteration in the price of English. Spelter, common Silesian, fetches £23 to £23. 10/, the stock in London being only 436 tons on November 30. Lead is in demand and realizes full rates.



New Haven, Conn., October 2d, 1872.

The manufacture and sale of

BLAKE'S STONE AND ORE CRUSHER,

Carried on hitherto by the firm of BLAKE BROTHERS, will from this date be conducted by

"THE BLAKE CRUSHER COMPANY,"

A Corporation located in New Haven, Conn. The Agencies at PITTSBURGH, Penn., and SAN FRANCISCO, Cal., will be continued as heretofore. Address

The Blake Crusher Company,

OFFICE: 85 Orange Street, New Haven, Conn.

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Advertising Rates.—One Square (12 Nonpareil lines, or one inch), one insertion, $2·50; one month, $7·50; three months, $15; six months, $25; one year, $40.

For years we have been laboring to make *The Iron Age* as perfect an exponent as possible of the Metal Trades of the United States, and to this end have spared neither effort nor expense. The success that has attended our labors has been so great that it is regarded as the foremost weekly commercial newspaper in the country, and is considered a standard authority on all trade subjects. Our aim has been to give in its columns all kinds of information that can benefit the manufacturer or dealer in Hardware or Metals, and make a paper that no member of the trade can afford to be without. It is taken and consulted by a large proportion of the best and most enterprising houses in every State of the Union, and few of them would be willing to give it up. The regularity with which subscriptions are renewed is a good indication of its value.

PROMINENT FEATURES OF THE IRON AGE.

Hardware Trade Report.—Under this heading is given a full and complete report of the condition of the Trade for the week, noting everything that can be of use or interest to either the manufacturer or dealer. We give all changes in discounts as soon as they occur, and print the particulars of almost all changes in lists. A great deal of labor is given to this department, which we are steadily making more complete and valuable. We have proved the incorrectness of the opinion which has largely prevailed, that it was impossible to give a report of the Hardware Market that would be of any use to buyers. On the contrary, in every State of the Union, numbers of the best Hardware men consider it indispensable.

Iron and Metal Reports.—These are not only the fullest, but the best arranged and most carefully prepared reports of the Iron and Metal Market published by any journal. They are impartial, and have foreshadowed correctly the course of the trade during the past two years. We have arrangements for reports from all the principal cities of the country, and our foreign advices are very full and complete, including a regular letter from a thoroughly competent English correspondent, who notes everything of interest transpiring in that country, with full price lists of Iron in the various sections of Great Britain. These letters will give the American iron master a better idea of trade matters in England—very important for him to understand—than he can gain in any other way. We also have regular reports on Metals from Berlin, Antwerp, Hamburgh, Rotterdam, Batavia, Valparaiso, Calcutta, Hong Kong, Penang, &c.

Quotations of Prices.—Our quotations of the prices of Hardware, Metals, Paints and Oils are full, and carefully corrected every Wednesday. It is our object to quote for buyers' information, and to give the actual selling prices. We also print reports and prices current from all the principal cities of the country, in most of which we have special correspondents.

Editorials.—In our discussions of current matters of interest to the trade, *The Iron Age* aims to be liberal in its views, exact in its information, and careful in the expression of opinions; never intolerant of the opinions of others, but never influenced in forming its own by any considerations other than a desire to establish the truth and refute error, to perpetuate a wise and beneficent system of protection under an equitable and well-digested tariff of imports, and to promote the welfare of the great productive industries of the country.

Illustrated Articles.—The department of New Patents is an important feature. Specifications and drawings of all patents relating to metallurgical processes, metal working, &c., are promptly forwarded to this office from Washington, and appear as promptly in our columns, with such illustrations as may be necessary to a full understanding of the nature, application and utility of the inventions. These patents, of great interest to iron masters and metal workers in all departments, are given in no other journal, and our enterprise in securing and publishing them at great expense, owing to the cost of the engravings, has been fully appreciated.

We also publish, with illustrations, descriptions of new and useful articles of hardware, improved metal working machinery and important engineering structures; and, when necessary, illustrate our special articles with choice cuts.

Business Items, of interest to the trade, are collected from all sources, and form a very attractive and useful feature of each issue.

Miscellaneous Articles.—The uniform excellence of the reading matter of *The Iron Age* has been from the first, one of its strongest claims upon the favor which it has enjoyed. Nothing of interest and importance to metal workers or metal dealers fails to receive due notice in its columns, and our ample space affords opportunity for the publication, or reproduction, of many important papers, reports, &c., for which no other American journal find room. A large amount of interesting matter is furnished weekly by our own writers and contributors, and our large and well-chosen list of exchanges enables us to give selections from the best journals and periodicals of the country and Europe. Our translations from the latest German and French newspapers and standard publications will be found especially valuable.

Scientific and Technical Notes.—This department, added during the past year, presents in condensed form the latest and most interesting scientific discoveries, experiments and inventions, and enables the reader to acquaint himself with the current scientific progress of this and other countries.

Advertisements.—Its advertisements, consisting of the announcements of the best manufacturers and merchants in the trade, are very useful to buyers of hardware, machinery, metals, &c. These advertisements are so numerous as to form almost a Directory of the Trade, and to buyers who prefer to deal at headquarters, they are invaluable.

All communications should be addressed to

DAVID WILLIAMS, Publisher,
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During the past year we have consolidated the Union and Backus Vises, retaining what we thought was best in each, and making a new Vise better than either. Hereafter all orders will be filled with this new Vise.

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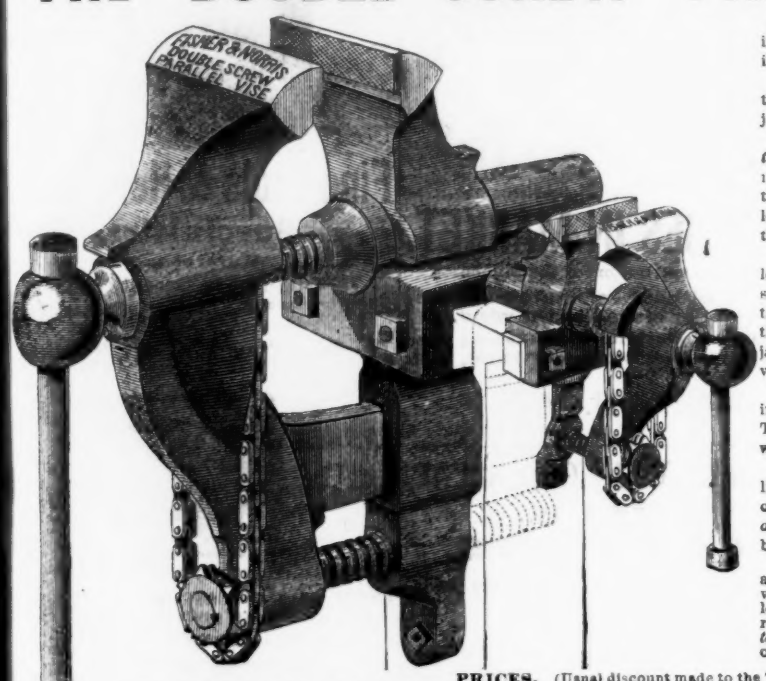

More than twenty-five years' use of this Vise by Machinists, Tool Makers, Locomotive Shops, &c., has established its superiority over every other.

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In this vise the jaws are kept *always parallel* by the lower screw moving in or out exactly with the upper, lever screw, by means of the chain connecting both: also, by their relative position *two-thirds* of the power applied at the lever screw is received by any piece held between the jaws—thus enabling the heaviest work ever required of a vise to be done with this.

The Screws are forged of the best refined iron, and work in *solid cut thread* boxes. The Jaws are faced with *best* Tool Steel, welded on, file cut, and properly tempered for wear.

The Chain is very carefully made of case hardened inside links and rivets, and, acting only to *regulate* the position of the lower screw for different points of opening, has *no direct strain* of the work upon it; it is therefore as durable as the other parts.

Only the strongest material is used in this manufacture, and from actual experiment on the six inch jaw vise, which has screws of 1⅝ inch diameter and lever 19 inches long, it has been found that applied at the lever Screw, it required to break either of the jaws, *eleven and one-half tons*, thus exhibiting a maximum strength far above *any* other vise of like size.

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No. 1. Width of Jaw 3 inches, and weighing about 12 lbs., $6·00 | No. 4. Width of Jaw 5 inches, and weighing about 80 lbs., $18·00
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FISHER & NORRIS, Trenton, N. J.,

Sole Manufacturers of these Vises, and of the "Eagle" Anvils.

HOWARD PARALLEL BENCH VISE.

(BALDWIN & DICK'S Patent.)

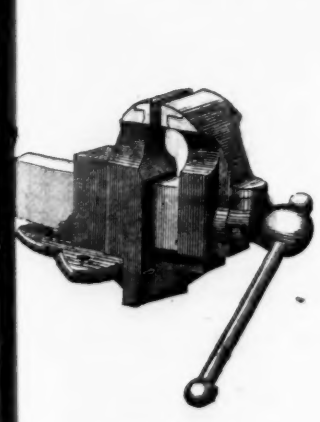

Fig. 1.

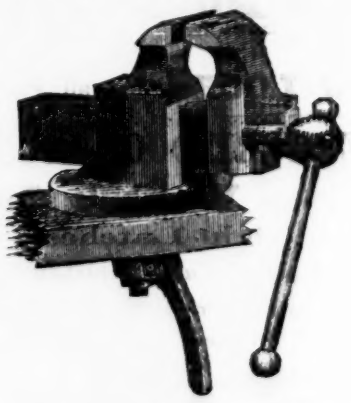

Fig. 2.

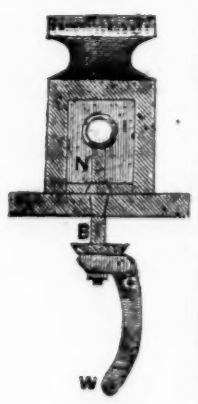

Fig. 3.

These Vises having been thoroughly tested during the past three years, and proving superior to any other Bench Vise yet produced, they are offered to the trade on liberal terms. An examination of the improvements is particularly desired.

The improvements claimed for these Vises, which are secured by Letters Patent, are: The malleable cast iron nut, which is rendered *immovable* by being set in the molten iron, thereby doubling the durability of both nut and screw, for they are saved from the destructive grinding, cutting and bending action of the cross-strain which has always been a great evil heretofore.

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These improvements apply to all of my vises; but additional and great improvements have been made in the *Swivel Vise*, which, in the opinion of many, must result in its being the favorite for all uses. There is great strength in its circular base, so that its side parts may be employed for light anvil uses, which is often convenient. In the center of this base, as seen in Fig. 3, is set, at the time of its being cast, the strong bolt B; the nut of this bolt, under the bench, is brought to a desired position on the bolt by the cam wrench C, W; the handle, W, is now forced down, and the cam, acting upon the short lever between the nut and the washer, exerts its very great and *duplicate* power in holding the Vise securely. So firmly does it hold it, that the combined force of several men exerted upon the Vise cannot move it from its position. And yet so convenient is the little machine, that this great power is instantly removed and applied.

The seat of the swivel is slightly concave, so that it shall rest upon the circumference of its base. Let it be observed that the nut of the bolt B is not turned the least when the strain is upon it, and so the thread is saved from wear. The bolt is so formed and set that it cannot be drawn from the casting.

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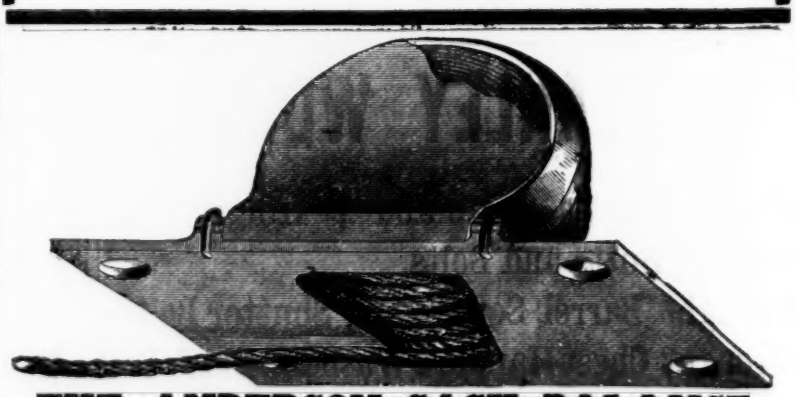

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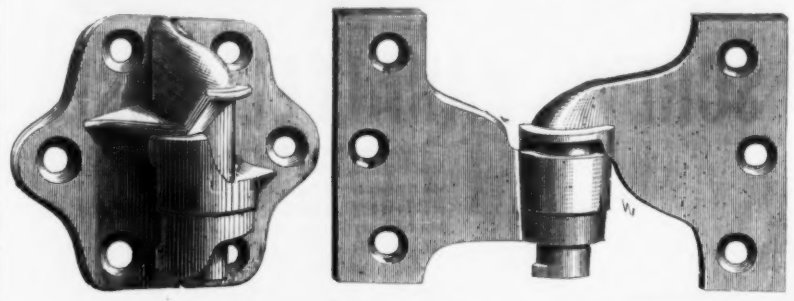

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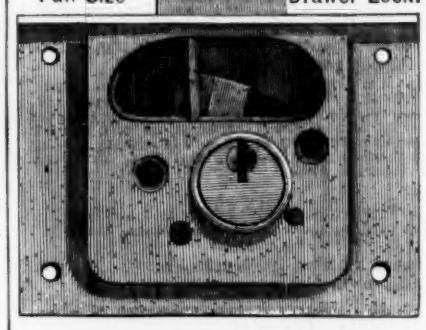
Full Size  Drawer Lock.

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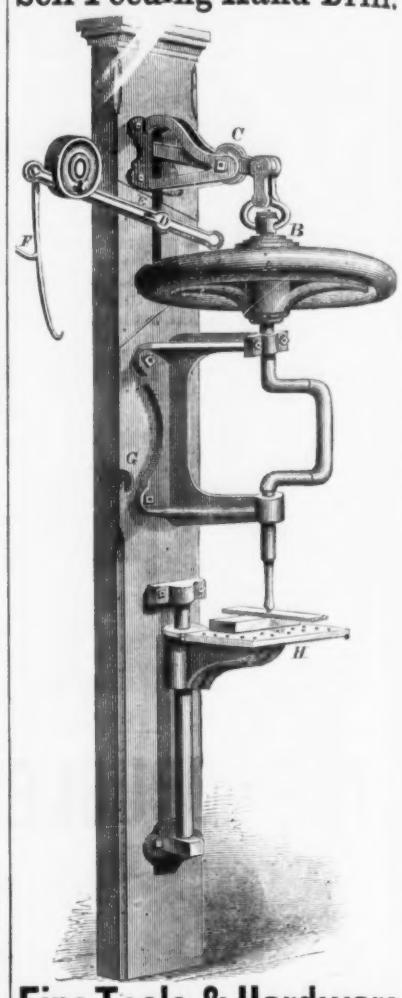

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Morticing Machines, each $18 00

Braces.
Barber's Patent dis 30&10 %
Wilson Mfg. Co. net @ add 5 %
Spofford's Patent dis 37½ %
Noble's Patent dis 33⅓ %
Bartholomew's dis 10 %
Bartholomew's Patent dis 25 %

Bung Hole Borers.
Common and Ring dis 20 %
Enterprise Mfg. Co dis 20 %
Ives' Tap Borers dis 20 %

Butchers' Cleavers.
Bradley's dis 15 %
Beatty's new list dis 10 %

2	3	4	5	6	7	8	9
$19·00	$21·50	$24·00	$27·00	$30·00	$33·50	$36·50	$40·00

Hart Mfg. Co dis 15 %

0	1	2	3	4	5	6
$13·00	$16·00	$18·00	$20·00	$23·00	$26·00	$30·00

Butts.
Wrought Brass new list dis 25 %
Cast Fast Joint Narrow dis 15 %
" " " Broad dis 30 %
Cast Loose Joint dis 40 %
" " " Mayer dis 30 %
" " " Parliament dis 30 %
Loose Pin Butts, Plain dis 25 %
" " Japanned dis 25 %
" " National dis 40 %
Wrought Fast Joint, Narrow net
Wrought Broad dis 15 %
" Loose dis 15 %
Wrought Table and Back Flaps net
Palmer Blind Butts dis 30&10 %
Nicholson Blind Butts dis 25 %
Parker's Blind Butts dis 25 @ 30 %
Clark's Blind Butts dis 25 @ 30 %
Seymour's dis 25 @ 30 %
Shepard's dis 25 @ 30 %
Garretson's dis 40 %
Standard dis 30 %
Union Mfg. Co.'s Drilled Fast Narrow net
" " " " " Broad dis 25 %
" " " " Loose dis 35 %
Whitney & Walt's Bronze Metal dis 20 %

Caps—Percussion per 1000.
G. D. 40c
Ely's E. B. 1-4s, 67½c; 1-10s, 75c, gold
" Double Waterp'f, 1-4s, $1·57½; 1-10s, $1·65c, gold
Cole's 1-4s, 82½c; 1-10s, 90c, gold

Cartridges.
Metallic dis 40 %

Cards.
Horse and Curry dis 20&10 %
Cotton and Wool dis 10 %

Casters.
Iron and Wood Wheel Plate dis 20&10 %
Brass Wheel Plate dis 10 %
Porcelain Wheel Plate dis 30&10 %

Chain.—By the Cask.
English Coil net gold

₱ lb.	13¼	10½	9½	9c	8¾	8½
	3-16	¼	5-16	⅜	7-16	½

Trace, 6½-10-2 ₱ pair, gold, 65c
Trace, 7-10-2 ₱ pair, gold, 70c
Galvanized Pump Chain ₱ lb 14c
German Halter Chain new list, gold, dis 10 %
German Coil new list, gold, dis 10 %
Jack Chain, Iron dis 35 @ 40 %
" " Brass dis 20 @ 25 %

Cherry Seeders.
₱ doz. $9 00

Chalk.
White ₱ gross, 50c
Red ₱ gross, 75c
Blue ₱ gross, 85c
Crayons ₱ gross, 14c

Chisels.
Socket Firmers dis 60 %
Socket Framing dis 60 %
Socket Corner dis 60 %
} Cash in 30 days an extra 5 %
Tanged Firmers dis 40 @ 40&10 %
Butcher's $5 00 to £ gold—new list
Spear & Jackson's $5 00 to £ gold—new list

Clips, Axle.
Norway or Best dis 20 @ 30 %
Superior dis 40 %

Coal Shovels.
Iron Handled ₱ doz, $ 85 @ 1 25
Wooden Handled ₱ doz, 1 00 @ 2 00

Cocks.
Brass Racking, Lock & Globe dis 10 %

Coffee Mills.
Common Board and Box dis 15 %
Better Grades dis 10 %
Increase Wilson's new list dis 10 %
French Steel dis 10 @ 20 %
"Champion" dis 20 %

Compasses and Dividers.
Bemis dis 15 @ 20&5 %
Excelsior dis 30 %
Peck, Stow & Wilcox dis 20 %

Coopers' Tools.
Bradley's dis 15 @ 20 %

Corn Knives and Cutters.
Bradley's list net

Curry Combs.
Hotchkiss' and Kellogg's, Iron and Brass dis 10 %
5 bbl. lots, dis 10&5 %; 10 bbl. lots, dis 10&10 %
Fitch's dis 20 %
Ruggles' dis 15 @ 20 %
Rubber ₱ doz., $9 00—dis 10 %

Curtain Pins.
Silvered Glass dis 40&10 %

Cutlery.
American Table
American Pocket dis 15 %

Door Springs.
Torrey's Patent $7 50 ₱ doz—dis 20&10 %
J. Palmer ₱ doz $5 50

Drawing Knives.
dis 60 %—Cash in 30 days an extra 5 %
Bradley's dis 25 %

Drills.
Morse's Bit Stock Drills dis 10 @ 15 %
Ingersoll's Ratchet (Wrought Iron) dis 25 %
No. 1, 12-in., $6 50 each; No. 2, 16-in., $8 75 each; No. 3, 20-in., $11 00 each.

Egg Beaters.
Monroe's ₱ doz net $8 25 @ 8 50
Ashley's ₱ doz net 2 25 @ 3 00
Earle's Patent ₱ doz net 5 50 @ 6 00
Pratt's Aerating dis 10 %
Dover ₱ doz net $6 00

Emery.
Genuine Chester—Regular Nos. ₱ lb 8c
" Flour and FF ₱ lb 5c
Washington Mills—Regular Nos. ₱ lb 8c
" Flour ₱ lb 5c

Enameled and Tinned Ware.
Kettles dis 10 %
Sauce Pans, Glue Pots, &c dis 5 %

Faucets.
Cork Lined, Wood dis 50 @ 50&10 %
Fenn's dis 50 %
" Cork Stops dis 40 %
Star dis 57½ %
Frary's Patent Petroleum dis 10 & 10 %
Taylor's Pattern Petroleum dis 20&10 %
Wood and Metallic" dis 40 %

Files.
American Best $5 00 to £ net
Nicholson—Mill $5 00 to £ net
" Others 5 00 to £ net
" Tapers (single cut) 5 00 to £ net
Moss & Gamble's $5 25 @ 5 75 to £ gold
J. & Riley Carr's, $5 50 to £ gold
Stubs' $8 00 @ 8 25 to £ gold
Butcher's $5 50 to £ gold
Spear & Jackson's 5 50 to £ gold
Hargreaves, Smith & Co.'s $4 75 to £ gold
Jowitt's 5 25 to £ gold
"Western" 5 00 to £ net
W. K. & C. Peace's "Imperial" $5 25 to £ gold
R. Ibbotson $5 00 to £ gold
Beam & Murray, "Cyclops" $4 85 to £ gold
Fisher,s $4 75 to £ gold
Goodlad's $4 00 to £ gold

Fluting Machines.
Acme $7 00 each net
Cole 5 75 each net
Peerless, No. 2 4 00 each net
Manvill, No. 2 7 00 each net
Knox, with 4-inch Rolls 5 00 each net
" " 6 " " 6 00 each net
O. K. 6 50 each net
Excelsior, No. 1 4 75 each net
" " 2 6 50 each net
Diamond 7 50 each net
Climax, 7-inch Rolls 8 00 each net
" 4½ " " 6 50 each net
Empire 4 00 each net
Eureka, No. 1, 7-inch Roll 8 00 each net
" No. 2, 5-inch Roll 6 00 each net
K. F. M., 4½ inch Roll 5 50 each net
" 6-inch Roll 6 00 each net
Carpenter's Self-Heating 13 50 each net
Fairy, Self Heater 10 00 each net
National, 5-inch Rolls 5 00 each net
Myer's Fashion Fluter, 4½ inch Rolls 3 00 each net

Fry Pans.
Tinned— dis 20 %
₱ doz $3·00 3·25 3·62 4·00 4·50 5·00 5·50 6·00 7·50
No. 0 1 2 3 4 5 6 7 8
Peck, Stow & Wilcox dis 20 %

Hammers.
Maydole's new list net
Cheney's new list net
Verree dis 5 %
Yerks & Plumb new advanced list dis 5 @ 10 %

Handles.
Hammer and Hatchet dis 10 %
Quakertown, Axe, Pick and Sledge dis 10 %
" Hammer and Hatchet net

Harness Snaps.
Judd's dis 30 %
Fitch's dis 30 %

Hatchets.
Isaiah Blood dis 10 %
Shingling, Nos. 1 2 3 ₱ doz $7 50 8 00 8 50
Claw, " 1 2 3 ₱ doz 8 50 9 00 9 50
Lathing, " 1 2 3 ₱ doz 7 50 8 00 8 50
Hunt's net
Shingling, Nos. 1 2 3 ₱ doz $7 25 8 00 8 75
Claw, " 1 2 3 ₱ doz 7 75 8 50 9 25
Lathing, " 1 2 3 ₱ doz 7 50 8 25 9 00
Hurd's dis 20 %
Shingling, Nos. 1 2 3 ₱ doz $8 00 8 50 9 00
Claw, " 1 2 3 ₱ doz 9 00 9 50 10 00
Lathing, " 1 2 3 ₱ doz 8 00 8 50 9 00
Newark Edge Tool Co's dis 25 %
Shingling, Nos. 1 2 3 ₱ doz $6 50 7 00 7 50
Claw, " 1 2 3 ₱ doz 7 25 7 75 8 25
Lathing, " 1 2 3 ₱ doz 6 50 7 00 7 50
Yerks & Plumb dis 10 %
Shingling, Nos. 1 2 3 ₱ doz $7 00 7 50 8 00
Claw, " 1 2 3 ₱ doz 7 50 8 00 8 50
Lathing, " 1 2 3 ₱ doz 7 00 7 50 8 00
Simmon's dis 10 @ 15 %
Shingling, Nos. 0 1 2 3 ₱ doz 7 50 8 00 8 50 9 00
Claw, " 1 2 3 ₱ doz 9 00 9 50 10 00
Lathing, " 1 2 3 ₱ doz 8 00 8 50 9 00
Broad, " 1 2 3 ₱ doz 9 00 10 00 12 00
" " 4 5 6 ₱ doz 14 00 16 00 18 00
" " 7 8 ₱ doz 20 00 22 60
J. P. Verree & Co dis 5 %
Shingling, Nos. 1, 2, 3 ₱ doz $6 98 7 35 7 87
Claw, " 1, 2, 3 ₱ doz 7 56 7 87 8 40
Lathing, " 1, 2, 3 ₱ doz 6 98 7 35 7 87

Hinges.
Wrought Strap and T net
Providence Plate 6 & 8 in. list 11c ℔; over 8 in. " 9½c ℔ dis 5 %

Hoes
Solid Shank, C. S. ₱ doz $8 00—dis 25 %
Socket, C. S ₱ doz 9 00—dis 25 %
Riveted Eye ₱ doz 5 00—dis 25 %
Planters'—Winsted add 10 %
Scovill add 33⅓ %
Scovill Pattern (Winsted) add 20 %

Hooks.
Belt dis 50 %
Bench ₱ doz net $5 00 @ 8 50
Wardrobe, Japanned dis 10&5 %
Hat and Coat " dis 10&5 %
Wrought Staples and Hooks and Staples dis 60 %
WroughtHasps and Staples and Hasps, Hooks and Wrought Stapies dis 60 %
Screw Hooks and Eyes, revised list dis 60 %

Horse Nails.
Putnam's.

No.	5	6	7	8	9	10
	32c	28c	26c	25c	24c	23c

In lots 1000 lbs. dis. 5 %.
Ausable.

No.	5	6	7	8	9	10
	30c	27c	25c	24c	23c	22c

In lots of 1000 lbs. 5 % discount.
Brundage.

No.	5	6	7	8	9	10
	29	26c	24c	23c	22c	21c

In lots of 500 lbs., dis 5 %
American Pressed.

No.	5	6	7	8	9	10
	24c	22c	22c	22c	22c	22c

In lots of 1000 lbs. 2 cts. less per lb.
Buffalo Forged.

No.	6	7	8	9	10
	30c	28c	27c	26c	25c

In lots of 1000 lbs. less 1c. per lb.; lots of 5000 lbs. less 2c. per lb.
Globe (Pointed and Polished).

No.	5	6	7	8	9	10
	31c	28c	26c	25c	24c	23c

In lots of 1000 lbs., 5 % discount.
National (Pointed and Polished).

No.	5	6	7	8	9	10
	30c	27c	25c	24c	23c	22c

In lots of 1000 lbs., dis 5 %.
Vulcan.

No.	5	6	7	8	9	10
	33c	30c	28c	27c	26c	25c

In lots of 500 lbs., 5 % discount.
" 1000 lbs., 7½ % discount.
New London Horse Nails.

No.	6	7	8	9	10
Great Western	27c	25c	24c	23c	22c
WB	29c	27c	26c	25c	24c

In lots of 1000 lbs., dis. 5 %.
Star Brand ₱ lb 16c
Morgan 16c

Horse Shoes.
Burden ₱ keg, $6 85
R. I. Horse Shoe Co., Perkins' Pattern ₱ keg, 6 85
" " R. I. Pattern ₱ keg, 7 35
Mule Shoes ₱ keg, 7 85

Kettles.
Enameled dis 10 %
Brass ₱ lb 55c
In lots of 500 lbs ₱ lb net 50c

Knives.
Butcher and Shoe, "Ames'" dis 15 %
Hay and Straw, "Wadsworth's" dis 15 %

Knobs.
Mineral and Porcelain, Trenton Lock Co } list June 8th, dis 25 %
Mallory, Wheeler & Co new list dis 40&2 %
Base—Common net
" Plush Tip dis 10 %
Elastic End reduced list dis 10&10 %

Lanterns.
Brady's Patent dis 10 %
Ætna dis 10 %
Yankee dis 10 %
De Beque dis 10 %

Locks and Latches.
Russell & Erwin Mfg. Co., Norwalk Lock Co., Branford Lock Co, Parker & Whipple, Nashua Lock Co, Trenton Lock Co } List of June 8th, Dis. 25 %
Mallory, Wheeler & Co revised list, dis 40&2 %
Pad Locks, (Mallory, Wheeler & Co), new list dis 40 %
Pad Locks, (R. & E. Mfg. Co), Revised list Sept. 10th, dis 40&2 %
Cabinet—Eagle dis 25 %
Cabinet—Gaylord dis 25 %
Trunk dis 10 %
Continental dis 15 %
Shepardsons dis 20 %

Meat Cutters.
Miles' Challenge Family dis 10 %

No.	1	2	3	4
₱ doz	$22 00	$30 00	$40 00	
Hales'	dis 10 %			
No.	11	12	13	
₱ doz	$27 00	$33 00	$42 00	
Eddy's	dis 10 %			
No.	50	55	60	
₱ doz	$25 00	$30 00	$40 00	

Perry's Champion (P. S. & W.) dis 5 %

No.	280	300	400
₱ doz	$22 00	$27 00	$40 00

Woodruff's (P. S. & W.) dis 5 %

No.	100	150
₱ doz	$15 00	$18 00

American dis 25 @ 25&5 %

No.	1	2	2½	3	4	5
Each	$6 00	$9 00	$11 00	$15 00	$30 00	$75 00

Molasses Gates.
Stebbins' Pattern dis 50&10 %
Tinned ends dis 40&10 %
Weed's Patent Self-Boring dis 15 %
" without Auger Bit dis 40 @ 50 %
Patent Self-Measuring per doz $42 00—dis 20 %

Mouse Traps.
Wood Choker 20 @ 24c ₱ doz holes

Nails.
10d Cut (Standard) nominally, ₱ keg $5 50

Nuts and Washers.
3c off list

Oil Stones.
Washita No. 1 ₱ lb 22c @ 25c
Washita Slips ₱ lb 44c @ 50c
Hindostan ₱ lb 6c net
Hindostan Slips ₱ lb 10c net

Oilers.
Olmsted's dis 25&10 %
Broughton's dis 25&5 %
Common Zinc, Brass and Copper dis 20 %

Picks.

Washoe R. R. Nos.	0	1	3	3	4	5
	per doz.	$14·00	15·00	16·00	17·00	18·00
Washoe Coal, "	$8·50	9·00	10·00	11·00	13·00	15·00

Picture Nails and Knobs.
Richards' Patent dis 40 @ 40&10 %

Planes.
Auburn Bench and Fancy dis 15 %
Bailey's Patent Adjustable dis 15&10 %
Howland's Bench and Fancy dis 15 %
Chapin's " " dis 15 %
Chapin's, 2d quality dis 15&5 %
Sandusky Tool Co. dis 15 %
Ogontz" dis 15&5 %
Plane Irons hst net
" " Butcher's $5 00 to £ gold—new list
" "Spear & Jackson's $5 00 to £ gold—new list
" " Sandusky Tool Co dis 5 %

Pumps.
Douglas Cistern, etc dis 15 %
" S. & F. dis 10 %

Rakes.
Cast Steel dis 25

$8 00	$9 00	$10 00	$11 00
8	10	12	14 teeth.

Razor Straps.
Genuine Emerson (B. F. Badger) dis 40&10 %
Hunt's dis 25&10 %
Chapman dis 10 @ 15 %

Rivets.
Iron and Tinned dis 25 %
Copper Rivets and Burrs net @ dis 10 %

Rods.
Stair new list dis 25 %
American Patent dis 25 %

Rope. Manufacturers' List.
Manila ½ inch and larger ₱ lb 18½c
" ⅜ inch ₱ lb 19c
" ⅜ & 5-16 inch ₱ lb 19½c
" Lath Yarn ₱ lb 18c
" Hay Rope ₱ lb 19c
Jute ₱ lb 12c
Sisal ½ inch and larger, ₱ lb 16½c
" ⅜ inch ₱ lb 17c
" ⅜ & 5-16 inch ₱ lb 17½c

Rules.
Boxwood and Ivory dis 40&10 %

Sad Irons.
₱ lb 5½ @ 6c
Myer's Hat and Toilet, with stand per doz $7 00

Sand Paper—dis 7½ @ 10 %
Beader & Adamson's (Flint) 00 to 1½ $4 50 ₱ ream
" " " 2, 2½ & 3 5 00 "
Assorted 4 50 "
Star ₱ ream $3 50
Emery ₱ ream $7 00 @ 12 00

Sash Locks.
Clark's dis 25 @ 30 %
Ferguson s dis 20 @25 %
Champion per gross $13 00 @ $15 00
Norwich dis 15 %

Sash Weights.
Solid Eyes ₱ lb 3½c

Sausage Fillers.
Perry's (P. S. & W) dis 5 %

No	1	0
₱ doz	$15 00	$21 00

Saw Rods.
list net

Saws.
Spear & Jackson's $4 50 to £ gold
John Spear $3 60 to £ gold
Am. Saw Co. new list
Inserted Tooth dis 10 %
All else dis 12½ %
Disston's Cross Cut, Circular and Mill dis 12½ %
Hand, Panel, Butcher, Back, &c dis 7½ %
H. W. Peace's Circulars dis 10 %
Other kinds dis 10 %
Wm. McNiece's Hand, Cross Cut and Circular new list dis 10 %
Lightning new list dis 20&12½ %
Electric dis 25 %

Scales.
Fairbanks' new list dis 15 @ 20
Howe's dis 15&5 %
Shattuck's Counter and Union dis 15 %
National Platform dis 25 %
Eureka dis 25 %
Scale Beams dis 20 %
No. 1 300 to 1200 lbs 90c. ₱ cwt
No. 2 " " 75c. ₱ cwt

Screws.
American and National Screw Cos.
Iron revised list dis 50 %
Round Head Iron dis 40 %
Brass dis 40 %
Round Head Silver Capped new list dis 20 %
Patent Gimlet Point Coach and Hand Rail dis 10 %

Scythes.
Blood's German Steel, Grass ₱ doz $10 00
" Cast " " ₱ doz 11 00
" Silver " " ₱ doz 12 00
" German " Grain ₱ doz 14 00
" Cast " " ₱ doz 15 00
50 doz lots—50 cts. off the above price.
Johnson's German Steel, Grass ₱ doz 9 25
" Cast " " ₱ doz 10 50
" German " Grain ₱ doz 12 00

Shears.
Cast Steel new list dis 60&7½ @ 65 %
Seymour's new list dis 50 %

Shovels and Spades.
Ames list July 1, '70, list net @ dis 2½ %
Rowland list Feb. 17, '72, dis 5 %
Old Colony dis 2½ %

Shovels and Tongs.
Iron Head list net
Brass Head dis 5 %
Polished Steel new list dis 15 %

Slates.
Square Frames, R'd Corn'd, by case dis 60&10 %
Less than a case dis 50 @ 55 %
Oval Frames, by case 40 @ 40&10 %
Less than a case dis 30 %

Spoons.
Iron new advanced list dis 10
By the case dis 20
Britannia dis 20
Plated A 1 dis 25&5 %
German Silver add 5 %
Tinned (P. S. & W.)—
Teas $1.50 ₱ gross, net
Tables 2·75 "

Stocks and Dies.
dis 15 @ 20 %

Stove Polish.
Joseph Dixon's ₱ gross $6 00 @ 6 25
Gold Medal ₱ gross $5·50

Squares.
Steel net; full cases,
Iron old list net; full cases, 10
Nickel Plated add $2 50 @ $4 00 ₱ doz net
Try Squares and T Bevels dis 35&10 %
Star Try Squares and Bevels dis 20 %

Tacks.
Full Weight American Iron dis 40&7½ %
Half Weight American Iron dis 70&7½ %
Carpet dis 7½ %
Brads American dis 50&7½ %

Finishing Nails	½	⅜	¾	⅝	1 in. and over
₱ lb	25	20	17	14	12½c dis 7½ %
Trunk and Clout	½	⅜	¾	⅝	1 in. and over
₱ lb	25	20	17	14	12½c dis 7½ %

Copper Tacks ₱ lb 56c—dis 7½ %
Iron Shoe Nails, ₱ lb 4-8 and longer, 10c; 3½-8, 10½c dis 7½ %
Double Pointed new list dis 33⅓ %

Tapes, Measuring
American Flask and Cap Co dis 20 %
Eddy's dis 10&10 %

Toe Calks.
per lb 13c

Tobacco Cutters.
Champion dis 20 %
Peck, Stow & Wilcox dis 10 %

Traps.
Newhouse dis 17½ %
Hotchkiss dis 20 %
Peck, Stow & Wilcox dis 30 %
Blake's Patent dis 15 @ 20 %

Vises.
Trenton Vises, Solid Box.
30 to 110 lbs 17c
111 to 160 lbs 18c
160 and over 21½c
Peter Wright's ₱ lb 16c. gold
Wilson's Solid Box dis 10 %
39 to 160 lbs. 18c
160 and upward 21c
Jameson's Parallel dis 25&10 %
Backus, Parallel dis 25&10 %
Union, Parallel dis 25%
Buffalo, Parallel new list dis 15 %
Fisher & Norris' Double Screw Parallel dis 20 %

Wire.
Bright and Annealed Nos. 0 @ 18 dis 20 @ 25 %
" " Nos. 19 @ 26 dis 30 @ 35 %
" " Nos. 27 @ 36 dis 35 @ 40 %
Coppered Nos. 0 @ 18 dis 15 @ 20 %
Galvanized dis 35 @ 40 %
Tinned dis 15 @ 20 %
Cast Steel net @ 5 %
Tinned Broom Wire dis 20 @ 25 %
Galvanized Telegraph, Nos. 8 & 9 ₱ lb 10 @ 11c
" " " 10 & 11 ₱ lb 11 @ 12c
" " " 12 ₱ lb 11½ @ 12½c
Annealed Fence, Nos. 8 & 9 dis 20 @ 22½ %
" Grape, " 10 to 14 dis 20 @ 22½ %
Fence Staples ₱ lb 10c

Wrenches.
Baxter's Adjustable "S" dis 30 %
Baxter's Diagonal dis 20 %
Collins & Co.'s new dis list 30 %
Coes' Genuine dis 30 %
Coes' Pattern (Wrought) dis 45 %
" " (Malleable) dis 50 %
Lindsay's Patent dis 25 %
Taft's Pattern dis 60&15 %

METALS.

IRON.—DUTY: Bars, 1 to 1½ cents per lb.; Sheet, Band, Hoop and Scroll, 1½ to 1¾ cents per lb. Provided, that none of the above Iron shall pay a less rate of duty than 35 per cent. Pig, $7 per ton; Polished Sheets, 3 cents per lb.; Wrought Scrap, $8 per ton; Cast Scrap, $6 per ton. All subject to a reduction of 10 per cent. Railroad, 70 cents per 100 lbs.; Boiler and Plate, 1½ cents per lb.

Pig Iron.

AMERICAN.

Foundry No. 1 Lehigh ₱ ton $45 00 @
Foundry No. 2 " 43 00 @ 44 00
Gray Forge " 40 00 @
White and Mottled "

SCOTCH.

Gartsherrie " 55 00
Coltness " 55 00
Glengarnock " 50 00 @ 52 00
Eglinton " 48 00 @ 49 00

Bar Iron.
Am. Refined, at mill ₱ ton, 100 00

Rails.
Welsh, gold ₱ ton, 71 00 @ 72 00
American, at works " @ 80 0
Old Rails, currency "

Scrap Iron.
Wrought Scrap " 43 00 @ 45 0

Bar Iron from Store.

Common Iron.

¼ to 2 in. round and square	₱ ton	$100 00
⅝x9-16 in. " " "	"	105 00
½ in. " " "	"	107 50
2½ to 3 in. " " "	"	105 00
1 to 6 in. wide x ⅛ and 1 in. thick	"	100 00
1¼ to 6 in. wide x ¼ & 5-16 in. thick	"	105 00
1 and 1¼ in. x ¼ and 5-16	"	107 50

Swedish Iron.

1½x⅜ and ½	₱ ton	155 00
1¾x⅜ to ⅝, and ⅝ square	"	150 00
1¾ to 5x⅜ to ¾ and ⅞ to 2-in. square	"	145 00
6 to 12x⅜ and ½	"	155 00

Refined Iron.

¼ to 2 in. round and square	"	105 00
1 to 6 in. wide x ⅜ to 1 thick	"	105 00
1¼ to 6 in. wide x ¼ and 5-16 thick	"	110 00
1 and 1¼ x ¼ and 5-16	"	112 50

Large Rounds.

2⅛ to 2⅞, round and square	"	122 50
3, 3⅛ and 3¼ in	"	117 50
3¾ and 4 in	"	125 00

Rods—⅜ and 11-16, round and square " 110 00
⅜ and 9-16, " " " 115 00
7-16, " " " 117 50
½, " " " 122 50
5-16, " " " 127 50
⅜ " " " 132 50
3-16, " " " 152 50

Band Iron.

1 to 6 in. x 3-16 to No. 12	"	122 50

Horse Shoe Iron.

¾ and ⅞ x ½, to ½	"	127 50
1 x ½, to ⅝	"	117 50

Ovals, Half Ovals and Half Rounds.

¼ to 1¼	₱ ton	130 00
⅝ and 11-16	"	135 00
½ and 9-16	"	140 00
7-16	"	145 00
⅜	"	150 00

Nail Rods

UB	₱ ℔	9c

Norway Shapes

½ to 2 in. x ¼ to ½	"	8¾c
¼ to ½ square	"	8¾c

Norway Bar.

½ to 2 in. square	"	7¾c

Spring Steel.

1 to 4 in. wide	"	

Tire Steel

⅞ to 1⅛ x ¼ & 5-16	"	
⅞ & 1 x 3-16	"	
⅞ & 1 x ¼	"	

Toe Calk Steel

½ to ⅝ x ¾ to ½	"	8¾c

Plow Steel.

6 to 16 wide	"	9¾c

Sleigh Shoe Steel

¾ to 1¼ x ¾ to ½ Stock	"	8¾c
Hoops, ⅝ x No. 22	₱ ton	172 50
" ¾ x No. 20	"	142 50
" ⅞ x No. 19	"	137 50
" 1 and 1¼ x No. 18	"	132 50
" 1¼ to 2 and 1x1¼ x No. 13 & 14	"	127 50
Scroll Iron—½x12	"	150 00
" " 10	"	140 00
" " 3-16	"	135 00
" " ¼ and 5-16	"	130 00
" ⅝ x 14	"	145 00
" " 12	"	140 00
" " 10	"	135 00
" " 3-16	"	130 00
" " ¼	"	125 00
" ⅝ x 14	"	137 50
" " 12	"	135 00
" " 10	"	130 00
" " 3-16	"	125 00
" " ¼	"	122 50
" " 5-16	"	122 50
" ⅞ x 14	"	132 50
" " 12	"	130 00
" " 10	"	125 00
" " 3-16	"	122 50
" " ¼	"	120 00
" " 5-16	"	120 00

Sheet Iron.

	English.	American
Nos. 10 to 20 ₱ ℔	6¾c	8c
21 to 24 "	7¼c	8¼c
25 to 26 "	7¾c	8¾c
27 "	7¾c	8¾c
28 "	8c	9c
30 "	8¼ @ 9c	

Galvanized, 10 to 20	₱ ℔	12c
21 to 24	"	13c
25 to 26	"	14c
27	"	15c
Patent Polished	"	15 c
Russia Nos. 8 @ 11,	"	20c @ 22 c
" Nos.12 @ 16,	"	20c @ 22 c
Belgian	"	13 c

One piece Corrugated Sheet Iron Elbows.

CHARCOAL IRON.

4½	5	5½	6	7 inch.
$3 75	4 25	5 25	5 25	6 50 per doz.

RUSSIA IRON.

4½	5	5½	6	7 inch.
$7 00	8 00	13 00	13 00	14 00 per doz.

Brass.

ROLLED AND IN SHEETS.

(Brown & Sharp's Gauge.*)

For the purchase of 100 pounds and over at one time :

HIGH BRASS.

All Nos. to No. 28, and widths 14 in. and under	40c
All Nos. to No. 28, inclusive and widths over 14 to 20 in. inclusive	43c
Over 20 in. to 30 in., inclusive	46c
Half-cent ₱ ℔ advance on each No. above No. 28 to 38, inclusive.	
All Brass thinner than No. 38 is Platers' Brass at	59c
Sheets 24x48 in., and all sheets cut to particular sizes and lengths	46c
Printers' Rules	50c
Sheets wider than 30 in. and under 40 in	50c
" 40 " and over	52c
Circular sheets, in diam. from 4 in. to 14 inclusive	50c
Circular sheets, in diam. over 14 in. to 20 inclusive	53c
Circular sheets, in diam. over 20 in. to 30 inclusive	56c
Circular sheets, in diam. over 30 in. to 40 inclusive	59c
Circular sheets, in diam. over 40 in	62c

LOW BRASS.

4 cents ₱ ℔ more than High Brass.

Gilding Metals, 7c. ₱ ₱ more than High Brass.

Platers' or Gold Metal	In Bars	52c
	Sawed	55c

FOR SLITTING : Metal in Width,

2 in. to ¼ in., to No. 30, inclusive, 1c. ₱ ℔ advance.
2 in. to 1 in., thinner than No. 30, 2c. ₱ ℔ advance.
1 in. to ¼ thinner than No. 30, 3c. ₱ ℔ advance.
¼ in. and less to No. 30, 2c. ₱ ℔ advance.
¼ in. and less thinner than No. 30, 5c. ₱ ℔ advance.
10 ⅌ discount.

SCRAP.

High Brass Scrap, 21 cents. net.
Low " " 23 " "
Gilding, 75 cents, net.
Turnings, Filings and Chips, half the price of Scrap, net.

BRASS AND COPPER WIRE.

(Stub's Wire Gauge.)

	High Brass.	Low Brass.	Gild'g and Cop'r.
Nos. 0 to 20	43	47	53
Nos. 21, 22, 23	44	48	54
Nos. 24 and 25	45	49	55

Brass Wire straightened and cut, 4 cents advance.
10 ⅌ discount

FINE WIRE—NET PRICES.

	High Brass.	Low Brass.	Gil and'd'g Cop'r.
No. 26	0·45	0·49	0·55
No. 27	0·48	0·52	0·58
No. 28	0·50	0·54	0·60
No. 29	0·52	0·56	0·62
No. 30	0·54	0·58	0·66
No. 31	0·56	0·60	0·70
No. 32	0·60	0·64	0·75
No. 33	0·64	0·68	0·85
No. 34	0·68	0·72	0·95
No. 35	0·73	0·77	1·07
No. 36	0·82	0·86	1·19
No. 37	1·02	1·02	1·32
No. 38	1·32	1·32	1·62

Ten cents per pound extra for Spooling.

TUBING

(Brown & Sharp's Gauge.)

	₱ ℔
Plain to No. 20, inclusive	$0·56
Nos. 21, 22, 23, 2c. advance on List for each No.	
Nos. 24, 25, 26, 4c. " " " "	
Above No. 26 special rates.	
Plain Tube, 1-4 inch	72
" " 3-16 "	1 57
" " 1-8 "	1 82

All Mandrel-Drawn Tubes 5c. advance on List.
Fancy Tubing 4c. advance on List above Plain.
English, Scotch, and Extra Patterns Fancy Tubing to No. 20 65
Tubing sawed or cut 2 to 4 ft. long, 2c. advance on List.
Add to two cents a half-cent for each additional cutting under two feet.
10⅌ discount.

BRASS DOOR RAIL, Polished.—52 cents per lb.—10 ⅌ discount.

BELT AND HOSE COPPER RIVETS AND BURS.

Price per ℔	57	58	60	62	64	66	68	72	76c.
Nos.	7	8	9	10	11	12	13	14	15

Braziers Rivets, 51 cents per pound.
Copper and Brass Rivets and Burs made to particular sizes and pattern.
The discount on the foregoing list will be 10 per cent.

GERMAN SILVER MARKET METAL AND WIRE.

	Market Metal.	Wire.
4 per cent. 12 inch. to No. 26	0·65	0·80
6 " " "	0·75	0·90
10 " " "	0·90	1·10
15 " " "	1·00	1·25
18 " " "	1·10	1·40
20 " " "	1·20	

German Silver Sheets over 12 inches wide and weighing more than 10 lbs. $2·60 ₱ ℔ tne
Advance two cents for each additional inch in width above 12 inches, and two cents per pound on each No. thinner than Nos. 26 to 36, inclusive.
All German Silver thinner than No. 36 is Platers' at 50 cents per pound additional.
German Silver Scrap, one-third less than net price of 12 inch Market Metal : German Silver Turnings, Filings and Chips, half the price of Scrap.
*Brown & Sharp's Gauge is about two numbers finer than Stubs' Wire Guage.

COPPER—DUTY : Pig, Bar and Ingot, 5 ; old copper, 4 cents ₱ ℔ ; Manufactured (including all articles of which copper is a component of chief value), 45 ⅌ ad valorem. All subject to a reduction of 10 per cent.

American Ingot	₱ ℔	34 @ 35c
English "	"	31 @ 32c

SHEATHING, BRAZIERS' COPPER, BOLTS, &c.

Braziers Copper, ordinary sizes, over 16 oz., per square foot	45c.	₱ ℔
Braziers' Copper, ordinary sizes, 16 oz. and over 12 oz., per square foot	48c.	"
Braziers' Copper, 12 oz. per square foot and lighter	51c.	"
Circles less than 84 inch in diameter	48c.	"
Circles, 84 inch diameter and over	51c.	"
Segment and Pattern Sheets	48c	"
Locomotive Fire Box Sheets	45c.	"
Sheathing Copper, over 12 oz. per sq. ft.	43c.	"
" 12 oz. ₱ sq. ft. & lighter	51c.	"
Bolt Copper	45c.	"

No Copper is Sheathing except 14x48 inches, and not to exceed 34 oz. to the square foot.

TINNING.

14x48, by the case	8c.	₱ sheet.
14x48, less than case	10c.	"
Boiler Sizes, 7 and 8 inch	12c.	"
" " 9 inch	15c.	"
Other sizes not larger than 30x60	2½c.	₱ sq. ft.
Larger than 30x60	5c.	" "

Copper Bottoms, 48c ₱ ℔.; 5 ⅌ discount.

O'NEIL'S PATENT PLANISHED COPPER.

14x48.

14 and 16 oz. and heavier	49c.	By the case, 48c. ₱ ℔
12 oz. and lighter	52c.	" " 51c. "

Boiler Sizes.

7 in., 14x52. 8 in., 14x56, 9 in., 14x60.

14 and 16 oz. and heavier	51c.	By the case, 50c. ₱ ℔.

(And all sizes not over 20 inches wide).

30x60.

14 and 16 oz. and heavier	53c.	₱ ℔.
12 oz	56c.	"

LEAD—DUTY : Pig, $2 per 100 lbs.: old Lead, 1½ cent per lb.; Pipe and Sheet, 2½ cents per lb. All subject to a reduction of 10 per cent.

Spanish	@ 6¾c	gold
German Refined	@ 6¾c	gold
English	@ 7¼c	gold
Bar	dis 10 ⅌	9¾c
Pipe	dis 10 ⅌	11 c
Tin Lined Pipe	dis 10 ⅌	16½c
Sheet	dis 10 ⅌	11 c
Shot	dis 10 ⅌ Drop, 11¼c; Buck, 12¼c	

STEEL—DUTY : Bars, Ingots, Sheets and Coils, valued at 7 cents per lb., or under, 2½ cents ; over 7 cents, and not above 11, 3 cents per lb. ; over 11, 3½ cents per lb. and 10 ⅌ ad val. Railway Bars 1¼ cents per lb. Railway Bars, in part Steel, 1 cent per lb. All subject to a reduction of 10 per cent. Provided, that Metal cemented, cast or made from Iron by the Bessemer or pneumatic process, of whatever form or description, shall be classed as Steel.

American Cast Steel.

Tool	17c
Spring	13½c
Homogeneous	13½c
Tire	12½ @ 13½c
Machinery (round and square)	11½ @ 12c
File	12½
Sheet	14 @ 16c
Saw Plate, mill and mulay	14 @ 16½c
saw Plate, gang and X cut	13 @ 14
circular as to size	18 @ 30c

Chrome Steel.

Tool	16 @ 18c
Machinery	11 @12c
File	12 @ 15c

English Steel—payable in gold, dis. 5 ⅌ cash.

do	Best Cast	₱ ℔	19½c
do	Extra Cast	"	20½c
do	Round Machinery, Cast	"	12½c
do	Swaged, Cast	"	21½c
do	Best Double Shear	"	19½c
do	Blister, 1st quality	"	15½c
do	do 2d quality	"	13½c
do	do 3d quality	"	11½c
German Steel, Best		"	12½c
do	Eagle	"	11½c
do	3d quality	"	10½c
Sheet Cast Steel, 1st quality		"	19½c
do do	2d quality	"	17½c

SPELTER—DUTY : In Pigs, Bars and Plates, $1 50 per 100 lbs.—less 10 per cent.

Silesian, cash	6¾ @ 7c.	gold
American "	7 @ 11c	currency

TIN—DUTY : Plates, Sheets, Tagger and Terne, 15 per cent. ad val. : Electro-galvanized Plates, 2 cents per lb. ; Manufacturers of, not enumerated, 35 per cent. ad val.—all subject to a reduction of 10 per cent. Bars, Banca or Block, and Pigs, free.

Banca	₱ ℔	33c, gold
Straits	₱ ℔	@ 32c. gold
English	₱ ℔	@ 32c, gold

CHARCOAL TIN PLATE.

I C 10x14, Prime Charcoal	@ 13·00
12x12, "	@ 13·50
14x20, "	@ 14·00
I X 10x14,	@ 15·25
12x12, "	@ 15·75
14x20 "	@ 16 25
For each additional X add	2·25 @ 2·50

COKE TIN PLATE.

	Best.	2d Quality.	Ordinary.
I C 10x14	$12·00	$11·50	$11·00
14x20	12·50	12·00	
12x12	12·50	12·00	

TERNE PLATE.

	Prime. Charcoal.	2d qual. Charcoal.	Coke.
I C 14x20	$11·50 @ 12·00	11·25 @ 11·75	10·50 @ 11·50
I X 14x20	13·50		

ZINC—DUTY : Pig or Block, $1 50 per 100 lbs. Sheet, 9¼ cents per pound. All subject to a reduction of 10 per cent.

Sheet	cask 10
"	open 10½

Paper Stock, Old Metals, &c

(Dealers' Selling Prices.)

Canvas linen	5½ @ 5¾
Canvas, cotton, No. 1	7½ @ 7¾
" " No. 2	4
White linen rags, No. 1	6½ @ 7
" " No. 2	5 @ 5½
Colored	3 @ 3½
Mixed woolens	2 @ 3
Soft woolens	11
Gunny bagging	2¾ @ 3
Jute Butts	1¾ @ 2
Kentucky bagging	3¾ @ 3¾
Book stock	4¾
Waste paper and scraps	2½ @ 3
Rope cuttings	1½ @ 3
Kentucky Bale rope	4 @ 4½
Oakum junk, No. 1	5 @ 5¾
" " No. 2	4
Grass rope	4 @ 4½
Tarred Shaking	2 @ 2½

Old Metal.

Copper	25 @ 26
Yellow metal	18 @ 20
Brass	18 @ 21
Old lead, solid	6¾ @ 7
Tea lead	5½
Wrought Iron	1¾
Sheet iron	1 @ 1¾
Cast iron	@ 1½
Machinery iron	1¾ @
Zinc	@ 5¾
Pewter, No. 1	27 @ 28
" No. 2	10 @ 12
Spelter	7

Paints, Oils, Glass, etc.

Paints.

Black, lamp—Coach Painters	₱ ℔ 20
" " Ordinary	6c
" Ivory Drop, fair	15c
" " best	26c
Black Paint, in oil kegs, 8c, asst'd cans, 10½c	
Blue, Prussian, fair to best	50 @ 75c
" " " in oil	35 @ 65c
" Chinese, dry	83c
" Ultamarine	25 @ 30c
Brown, Spanish	1¾c
" Van Dyke	3c
Carmine, French	$14 00
Green, Chrome	15 @ 25c
" " in oil	18 @ 25c
" Paris good, 30c, best, 40c	
" " in oil 30c, " 45c	
Mineral Paints	1¾ to 4c
Orange Mineral	14½c
Red Lead, American	9¼c
" " English	10½c
" Venetian (N. C.) dry	2¾c
" " in oil asst'd cans, 11c, kegs, 8½c	
" Indian, dry	10c
Rose Pink	18c
Sienna, American, Raw	4c
" Burnt	4½c
" " in oil	16 @ 20c
" Raw "	15 @ 25c
Umber, Burnt	4 @ 8c
" " in oil	16 @ 21c
" Raw	3½ @ 7½c
" " in oil	16 @ 22c
Vermillion, Chinese	1 45
" English	1 30
" Trieste	1 05
" American, Common	24c
White Lead, American, pure dry	10½c
" " " in oil	11½c
White, Paris, English, prime in bbls. 2¾ @ 2¾c	
Yellow Ochre, French	2¾ @ 2¾c
" " " in oil asst'd cans, 11c, kegs, 8½c	
" " Vermont in casks 1½c	
" Chrome	17 @ 27c
" " in oil	18 @ 28c
Zinc White, American No. 1 dry scarce	10c
" " " 1, in oil	12c
" French (Paris)	11½c
" " in oil	12½c

Oils.

Linseed Raw	₱ gal. casks, 90c, bbls, 91c
" Boiled	" 95c, " 96c
Whale, Crude	"
" Bleached Winter	"
Sperm, Crude	"
" Winter unbleached	"
" " Bleached	" 1 85
Seal, Extra Refined	" 87½c
Lard, Pure Winter	" 80c
" Spring	" 75c
Cotton Seed, Crude	" 55c
" Southern Yellow	" 60c
" White	" 75c
Neatsfoot, Winter	" $1 35
Natural Lubricating	" 45c

Sundries.

Asphaltum	8c
Benzine	₱ gal. 30c
Chalk	1¼c
" Block	
Dryer, Patent, Am'n asst'd cans, 11½c., kegs, 9c	
" " English " " 12c., " 11c	
Flocks	
Frostings	50c
Glue, White	33 @ 45c
" Sheet	20c
Glazier's Points, Zinc	9c
Gum, Copal	80c
" Damar	25c
" Shellac, English	50c
" " dark	46c
Litharge	10c
Pumice Stone, selected Lumps	5 @ 7c
" " powdered	4c
Putty in bladders	3½c
" in bulk	3c
Rotton Stone, soft, English	5c
Sand Paper, crystal	$3 25
" " flint	4 50
Spirits Turpentine	60c
Whiting, Spanish	1¼c

Glass.

French Window—1st, 2d, 3d, and 4th qualities.
Per box of 50 feet.

SINGLE.

SIZES.	I.	II.	III.	IV.
6 x 8 to 7 x 9	$8·00	$7·00	$6·50	$6·00
8 x 10 to 10 x 14	9·00	8·00	7·25	6·50
10 x 15 to 12 x 16	9·75	8·75	7·75	7·00
11 x 18 to 16 x 22	10·25	9·25	8·25	7·50
15 x 24 to 15 x 32	12·50	11·50	10·50	8·50
20 x 28 to 22 x 30	15·00	13·00	11·00	9·00
26 x 28 to 22 x 36	16·00	14·50	12·50	
24 x 36 to 24 x 40	18·00	16·00	13·50	
28 x 38 to 26 x 44	18·50	16·50	14·00	
28 x 44 to 30 x 48	20·50	18·00	15·00	
30 x 50 to 32 x 52	22·00	20·00	16·00	
32 x 54 to 32 x 58	26·00	23·00	18·50	
34 x 58 to 34 x 60	30·00	27·00	22·50	
36 x 60 to 40 x 60	36·00	33·00	28·50	

DOUBLE.

SIZES.	I.	II.	III.	IV.
6 x 8 to 7 x 9	$12·00	$11·50	$10·00	$9·50
8 x 10 to 10 x 14	13·50	12·00	11·00	10·00
10 x 15 to 12 x 16	15·00	14·00	12·50	11·00
11 x 18 to 16 x 22	16·50	15·50	14·00	12·00
15 x 24 to 15 x 32	20·00	18·00	17·00	
20 x 28 to 22 x 30	24·00	22·00	18·50	
26 x 28 to 22 x 36	26·50	24·00	22·00	
24 x 36 to 24 x 40	30·00	27·00	23·50	
28 x 38 to 26 x 44	32·00	28·50	25·50	
28 x 44 to 30 x 48	34·50	31·00	27·00	
30 x 50 to 32 x 52	36·50	33·00	28·50	
32 x 54 to 32 x 58	43·00	39·00	34·00	
34 x 58 to 34 x 60	50·00	45·00	40·00	
36 x 60 to 40 x 60	60·00	55·00	50·00	

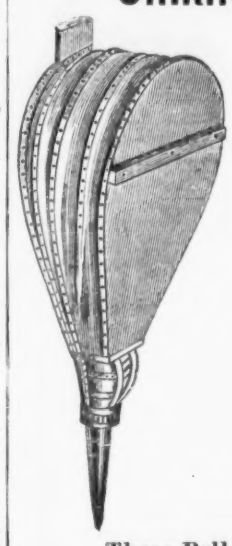
Dis. 1 40 to 40x60 0%.

GEORGE E. NEWCOMB. JAMES W. NEWOCMB. JOHN H. NEWCOMB.

NEWCOMB BRO'S SONS,

Manufacturers of

Smiths', Moulders' and Hand



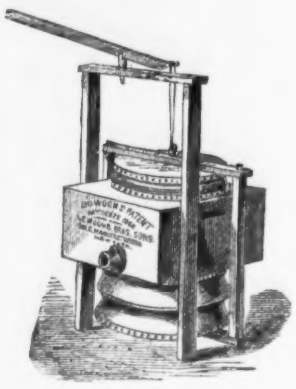
Also the Sole Manufacturers of

Bowden's Patent

TRIPLE-ACTION

Forge

Bellows.



These Bellows are superior to all others now in use.

They can be used either in single or double-action, for light or heavy work, as required. They maintain a steady and continuous blast, the air being forced into the chest both at the up and down stroke. The strength of blast obtained is double that of the ordinary bellows of the same dimensions. They work easily. While the blast is double, the power required to work them is no more than that of a common bellows. Being fully rigged and geared, ready for work, and easily moved from place to place, they are very convenient or rail road, mining, and other purposes where portable bellows are required. They economize space, occupying only half the room of an ordinary bellows. These Bellows come to hand at once. A good blast is obtained at the first stroke, and no time or labor is lost, as in the old single-action bellows, in getting up a good blast. They can be made of any size and shape, to suit all requirements. They are the cheapest Bellows in the world. With all the advantages of double-action, they cost no more, power for power, than the common single-action of same quality. For further particulars send for descriptive circular and price list.

586 Water St., near Montgomery, N. Y.

STATE RIGHTS FOR SALE.

Canal Street, East Broadway and South Street Cars cross Montgomery Street.

THE CORRUGATED STOVE PIPE ELBOW,

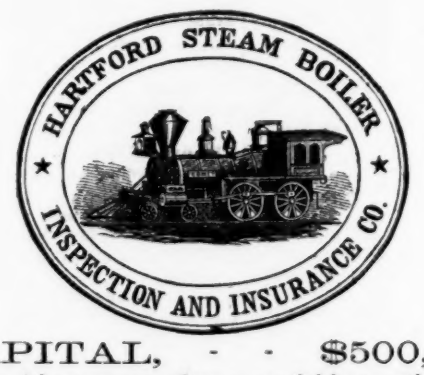
Strong, **Cheap.**

Durable. **No Soot,** **Better Draft.**

MANUFACTURED BY

SELLEW ELBOW CO.,

48 Cliff Street, NEW YORK. 27 North Canal Street. CHICAGO.



CAPITAL, - - $500,000.

Issues Policies of Insurance, after a careful Inspection of the Boilers,

COVERING ALL LOSS OR DAMAGE TO

Boilers, Buildings and Machinery,

ARISING FROM

STEAM BOILER EXPLOSIONS.

The Business of the Company includes all kinds of STEAM BOILERS.

Full information concerning the plan of the Company's operations can be obtained at the COMPANY'S OFFICE, HARTFORD, CONN., or at any Agency.

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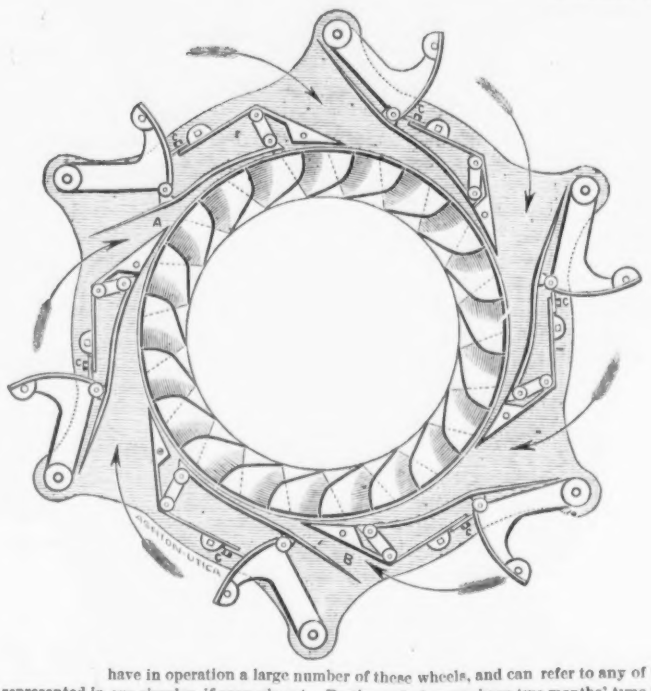
New York Branch, No. 1 Park Place.

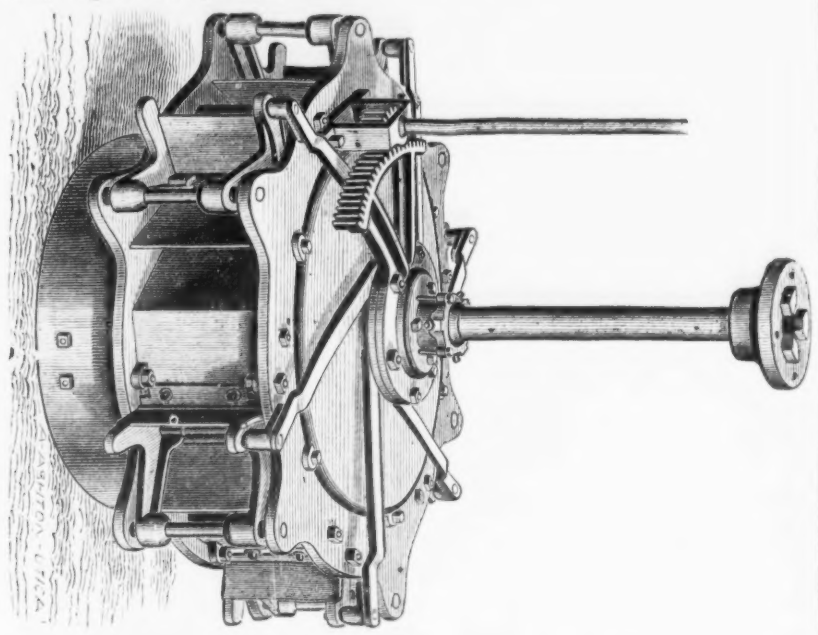
D. H. Whittemore's Hash, Mince Pie Meat and Sausage Meat Cutter.

Also, cuts Vegetables, &c. It will cut hash, including potato, in one minute, saving much time in preparing meals. It will cut mince pie meat and sausage meat in from two to three minutes, and with less labor than in chopping the same time with a common knife! While it is superior as a sausage meat cutter, it is much more valuable to the family for cutting boiled meat and vegetables, because much more frequently brought into use, yet costs no more than "Sausage" Meat Cutters. The meat in the Machine is simply rolled under the knives, so that but little power is required. The machine has been thoroughly tested, is meeting with a ready sale, and is warranted to be all that it is represented. Retail Price, $3·00 ; Wholesale Price, $27·00 per doz. Orders are respectfully solicited. Manufactured by *D. H. WHITTEMORE, Worcester, Mass.*, Manufacturer of the "Bay State" and "Skeleton" Apple Paring, Coring and Slicing Machines, "Union" Apple Parer, "Bay State" Peach Parer, Peach Stoner and Halver, Nut Cracker, &c.

CLIMAX TURBINE WATER WHEEL.

Patented by J. L. HELMER, August 25th, 1868.





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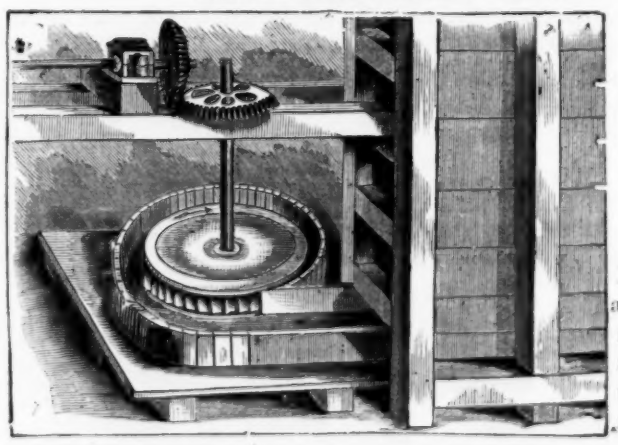

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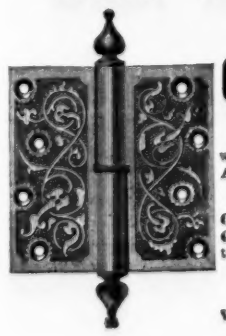

ERIE RAILWAY.

WINTER ARRANGEMENT of Trains taking effect Nov. 4th, 1872. From Chambers St. Depot. (For 23d St. see note below).

9·00 A. M. Cincinnati and Chicago Day Express. Drawing Room Coaches to Buffalo and Niagara Falls, and Sleeping Coaches to destination.

11·00 A. M. Express Mail for Buffalo and Niagara Falls. Drawing Room Coach to Susquehanna and Sleeping Coaches to destination.

5·30 P. M. Night Express. Sleeping Coaches to Buffalo and Niagara Falls.

7·00 P. M. (Daily) Cincinnati and Chicago Night Express. Sleeping Coaches through to Cincinnati, Buffalo, Niagara Falls, and thence to Chicago.

Additional Trains leave for

Newark, 6·30, *8·45 and 11·30 A. M., and 3·15, 5·15 and *6·30 P. M.

For Port Jervis, 8·00, 9·00, 11·00 and *11·15 A. M., 4·30, 5·30, †6·30 and *7·00 P. M.

For Goshen and Middletown, *7·30, 8·00, †8·30, 11·00 and *11·15 A. M., 3·30, 4·30, 5·30, †6·30 and *‡7·00 P. M.

For Warwick, 8·00, 11·00 and *11·15 A. M., 4·30 P. M.

For Newburgh, 8·00, †8·30, 9·00 and 11·00 A. M., 3·30, 4·30 and 5·30 P. M.

For Suffern, †7·20, 8·00, †8·30, 11·00 and *11·15 A. M., 3·30, 5·00, †6·30, 7·00 and *11·30 P. M.

For Ridgewood, Hohokus, Allendale, and Ramsey's, †7·30, 8·00, †8·30, 11·00, *11·15 A. M., 3·30, 5·00, 6·00, †6·30, 7·00 and *11·30 P. M.

For Paterson, 6·45, *7·30, 8·00, †8·30, 10·30, 11·00, *11·15 A. M., 12·00 M., *1·45, 3·30, 4·00, 5·00, 5·15, 5·30, 6·00, *6·30, *7·00, 8·00, 10·00 and *11·30 P. M.

For Rutherford Park and Passaic, 6·45, *7·30, †8·30, 10·00, 11·00 A. M., 12·00 M., *1·45, 3·30, 4·00, 5·15, 6·00, *6·30, 8·00 10·00 and *11·30 P. M.

For Hackensack and Way, 5·00 8·15 and †8·45 A. M., 1·00, 4·00, 5·00, 6·00 and 6·30 P. M., and Saturdays only, 12·00 midnight.

For Hillsdale and Way, 5·00, 8·15 and †8·45 A. M., 1·00, 4·00, 5·00 and 6·00 P. M., and Saturdays only, 12·00 midnight.

For Spring Valley and Way, 5·00, 8·15 †8·45, and ·00 A. M., 1·00 4·42, 5·00 and 6·00 P. M., Saturdays only 12·00 midnight.

For Englewood 5·00, 7·45, *9·00, A. M., 1·30, 3·15 4·15, 4·45, 5·30, 6·30 and *7·45 P. M. Saturdays only, 12·00 midnight.

For Cresskill, 5·00, 7·45, *9·00 A. M., 1·30, 3·15, 4·15, 5·30, 6·30 and *7·45 P. M. Saturdays only, 12·00 midnight.

For Upper Piermont, 5·00, 7·45, *9·00, A. M., 1·30, 4·15, 4·45, 5·30, 6·30 and †7·45 P. M. Saturdays only, 12·00 midnight.

For Piermont and Nyack, 7·45 and *9·00 A. M., 1·30, 4·45, §5·30, 6·30 and †7·45 P. M. Saturdays only 12·00 midnight.

N. B.—Trains leaving Chambers street on even hours or half hours leave 23d street fifteen minutes earlier than above time. The 5·00 A. M., 10·00 and 11·30 P. M. Trains start from Chambers Street only.

N. B.—Trains on the N. R. R. and Newark Branch leaving Chambers street on quarter hours, leave 23d street thirty minutes earlier than above time.

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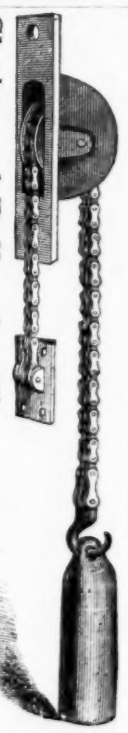

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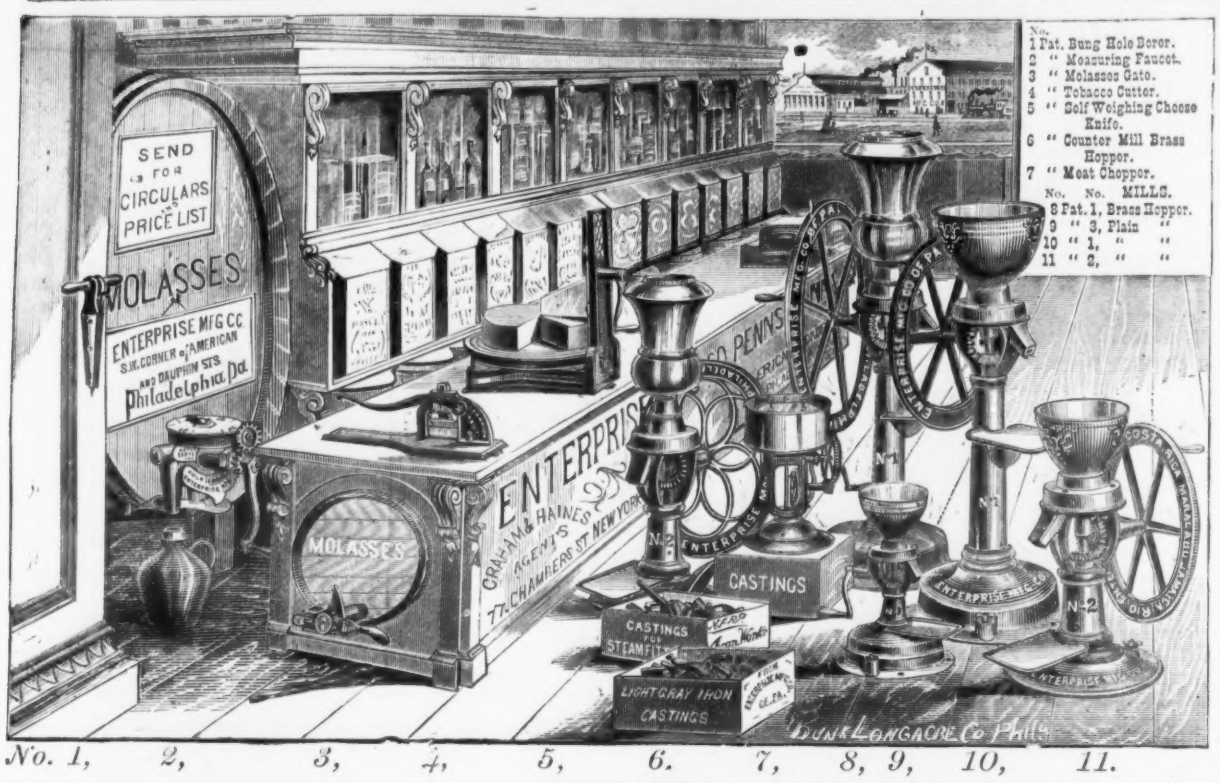
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Common Hods, Morning Glory Hods, Excelsior Hods for self-feeding Stoves, and all kinds of Fancy Hods.

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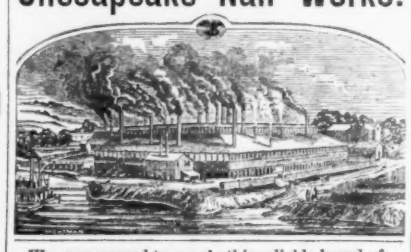

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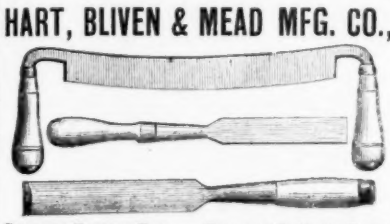

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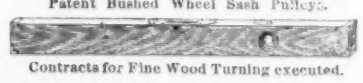

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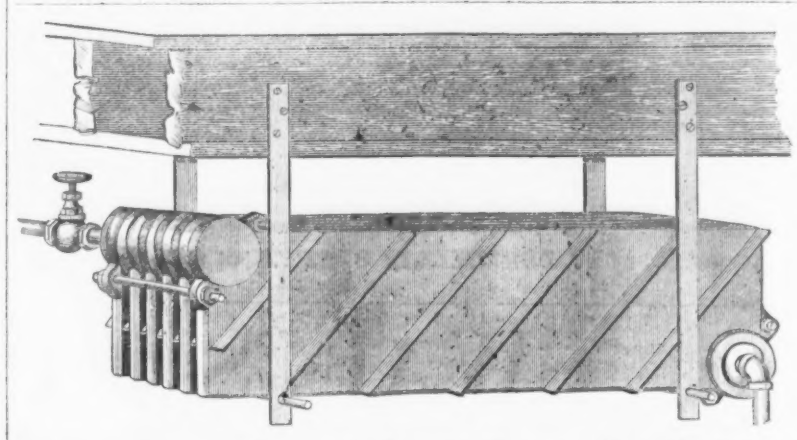

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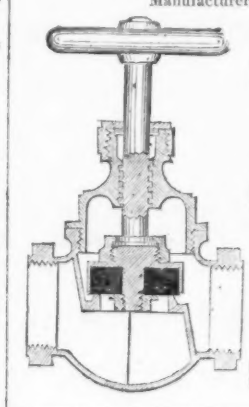

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Galvanized Pump ₱ lb 15c
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Pennsylvania Pattern dis 10%

MOLASSES GATES.

Enterprise Mfg. Co.'s Measuring Faucets dis 20%
Stebbins' Gates dis 40&10 @ 50%
Lincoln's " dis 40 @ 40&10%
Landers, Frary & Clark's, Petroleum dis 10 @ 10&10%
Taylor's Petroleum Faucets dis 20 @ 20&10%

MEAT CUTTERS AND STUFFERS.

Stow Mfg. Co. Meat Cutters, new list dis 5%
Dixon " " " dis 5%
Hale " " " dis 10%
Stow Mfg. Co. Stuffers dis 5%

RULES.

Stanley Rule and Level Co dis 30&10%
Stevens and Hubbard's dis 30&10%

SQUARES.

Steel Squares, advanced August 1st list net
Iron " " 1st list net

SAWS.

Disston's Hand, Mill and Circular dis 12½%
Wm. McNiece's Hand, Cross-Cut and Circular, new list dis 10%
Boynton's Lightning, new list dis 30%

SHOVELS AND SPADES.

Rowland's Plain Back, advanced Apr. 1872 dis 5&5%
" Back Strap " " dis 5&5%
Oliver Ames & Sons, advanced April 8 net list
Brady Shovel Co dis 7½%

SAD IRONS.

Reading (planed face) per lb. 6c.
Coquanock (polished face) " 5c.

STOVE POLISH.

Gem per gross $5 00
Onyx " $5 00

SASH LOCKS.

Clark's Patent dis 20%
Ferguson " dis 20%
Bonney's " Improved dis 25%

SCREWS.

Iron (list Mar 6) dis 50%
Brass (Brass Screw list) dis 40%

SPOONS.

Plated Spoons, Rogers Bros.' dis 25%
Britannia, Parker's and Boardman's dis 20%
German Silver add 10% to list
" " Light list net

TRY SQUARES.

Stanley Rule & Level Co dis 40%
Diston's dis 12½%

TACKS, CLOUT AND FINISHING NAILS.

Half Weight Tacks dis 70%
" " by case dis 70&7½%
Clout and Finishing Nails 7½%
" " by the case dis 7½%

TRAPS.

Genuine Oneida—Newhouse list dis 15%
Imitation " " " dis 20%

WRENCHES.

Coes Genuine dis 30%
Coes Imitation Wrought Bar dis 40%
" " Malleable Bar 40&10%
Tafts Wrought Bar 60%
Tafts Malleable Bar 65%

WIRE.

No. 0 to 18 dis 15%
No. 19 to 26 dis 27½ @ 30%
No. 27 to 36 dis 33⅓ @ 35%
Coppered 0 to 12 dis 15 @ 20%
Tinned Broom Wire dis 10 @ 15%
Bradlee & Co., Office Nos. 19 & 21 South Fourth st., Philadelphia. Price list of Proved and Warranted Chains. Discount ¾c. per lb.

SHORT LINK CHAIN.

Size. Inches.	Average Wt. Per Fathom. Lbs.	Proof. Tons.	Price Cts. Per Lb.
¼	15	4	10½
9-16	19	5	10
5-8	25	6	9½
11-16	30	8	9⅜
¾	35	10	8¾
13-16	40	12	8⅝
⅞	47	14	8½
15-16	54	16	8⅜
1	60	18	8¼
1 1-16	67	20	8⅛
1⅛	74	23	8
1 3-16	82	26	7⅞
1¼	90	28	7¾

All larger sizes same price as 1¼ inch.
Stud Chain 2½c. less than same size close link.

PITTSBURGH.

From the Pittsburgh Commercial.

FLAT BAR.

1½ to 4 by ⅛ to 1 inch 4·6c
1¼ to 6 by ⅛ to 1 inch 4·8c
1¾ to 6 by 1⅛ to 1½ inch 5·0c
1¼ and 1¾ by ⅛ to ¾ inch 4·8c
1 and 1½ by ⅜ to ¾ inch 4·9c
⅝, ¾ and ⅞ by ⅜ to ⅝ 5·0c

HORSE SHOS.

All sizes 6·1c
Nail rods 8·5c

HEAVY BANDS.

3½ to 6 by ¼ and 5-16 inch 5·2c
1⅝ to 3¼ by ¼ and 5-16 inch 5·3c
⅜ to 1⅛ by ¼ and 5-16 inch 5·6c
½ to ¾ by ¼ and 5-16 inch 5·8c

LIGHT BANDS.

3 to 6 by 3-16 to No. 12 5·6c
1¼ to 2¾ by 3-16 to No. 12 5·8c
1 to 1⅝ by 3-16 to No. 12 6 2c
½ to ⅞ by 3-16 to No. 12 6·8c

HOOPS.

2¼ to 3 inch 5·9c
3½ to 4¾ inch 6·1c
1¾ to 2 inch 6·1c
1¾ to 1 11-16 inch 6·4c
1½ and 1¼ inch 6·7c
1 inch 7·1c
⅞ inch 7·6c
¾ inch 8·1c
⅝ inch 8·6c
½ inch 9·1c

ROUND AND SQUARE.

1 to 1⅞ inch 4·6c
2 to 2¾ inch 4·9c
3 to 3⅜ inch 5·1c
3¾ to 4 inch 5·6c
⅞ to 9-16 inch 5·0c
½ to 7-16 inch 5·3c
⅜ inch 5·4c
5-16 inch 5·8c
¼ inch 6·2c
3-16 inch 8·2c

OVAL IRON.

⅞ to 1¼ inch 5·2c
½ to ¾ inch 5·4c
⅜ inch 5·6c
¼ inch 6·2c

HALF OVAL AND HALF ROUND.

⅞ to 1¼ inch 5·5c
½ to ¾ inch 6·0c
⅜ inch 6·7c
¼ inch 8·2c

	Boiled.	Charc'l.	Juniata.
Sheet Iron, 10 to 14	6·2	7·7	9·2
" " 15 to 20	6·4	7·9	9·4
" " 21 to 24	6·6	8·1	9·6
" " 25 to 26	6·8	8·3	9·8
" " 27	7·0	8·5	10·0

All sheets over 38 in. wide, ⅛c. ₱ lb extra.

TANK IRON.

3-16, ¼ and ⅛ inches thick 6·0
Boiler Plate Iron 7·9
Heads not flanging 7·1
Heads flanging 8·9
Plow Slabs 6·8
Plow Wings 7·3

RAILROAD IRON—COUNTERSUNK AND PUNCHED.

1¼ by ⅜, 7-16 and ½ inch 5·6
1¼ by ½ and 5-16 inch 6·1
1½, 1¾ and 2 by ½ and ⅝ inch 5·1
1½ by ⅝ inch 5·3

EXTRAS FOR CUTTING TO LENGTH.

Flat bars and rounds and squares 1c
Flat bars for tire 1c
Heavy bands 3c
Light bands and wagon box iron 4c
Hoops 5cc

TERMS.

Note or acceptance at sixty days, with currant rate of exchange on New York, or a discount of 2 per cent. for cash, if remitted within fifteen days of date of invoice. Payment to be made in New Bork exchange, United States Treasury notes, or their equivalent. No discount on bills of less than $50.

Heavy Hardware.

The following are the card rates of Lewis, Oliver & Phillips:

Iron, standard list, assorted sizes, for large orders, 4·6c, card rate, 2% off net.
Iron wedges 7½c ₱ lb net
Norway Nail rods 9½c ₱ lb net
Fence Pickets—
¾ round, bent to shape....40c ₱ ft. fence, less 10% Discount off Standard List.
Carriage and tire bolts, 60% off net
Plow blots 15% off net
Stove bolts list net
Machine and square head bolts new list....15% off net
Coach and lag screws, new list 15% off net
Bolt Ends, new list 15% off net
Square and hexagon nuts and washers, new list 2¾c ₱ lb off net
Washers new list, 4c ₱ lb off
1c. ₱ lb extra for less than 1 keg of each size.
Harrow teeth, in lots of 1 ton or more, 1 in. diam 6c; ¾ & ⅞ in. diam. 6c; ⅝ in. diam. 6½c ₱ lb.
Patent Headed Harrow Teeth, packed in casks ½c extra ₱ lb net.
Skein bolts, in bulk, in lots of 1 keg or more, ⅛in. diam. 9¼c; 9-16 in. diam. 10½c; ½ in. diam. 11½c. 1c. ₱ lb extra when less than 1 keg of each size is ordered.
Screw Hook-and-Eye Hinge, ¾ to 1in. diam. 10¾c; ⅝ in. diam. 11¾c; ½ in. diam. 13½c ₱ lb, net.
Screw and Strap Hinges, in lots of 50 pairs or more, 14 to 36 in. long, 8c; 8, 10 and 12 in. long, 9½c ₱ lb net.
Strap and T Hinges net list
6 months purchases over $1000, 5% dis. allowed.
Screw hitching rings $7 50 ₱ 100 net
Duck nest tuyere irons $17 00 ₱ doz. net
Cast iron washers 5¼c ₱ lb net
Bridge and Roof Bolts—
1 to 2 in. diam. over 8 feet long. ₱ lb 6c
1 to 2 in. diam. from 4 to 8 feet long 6½c
1 to 2 in. diam., from 1½ to 4 feet long 7c
⅝, ¾ and ⅞ in diam., over 4 feet long 7¾c
⅝, ¾ & ⅞ in diam., from 1½ to 4 feet long 7¾c

WAGON HARDWARE.

Wagon Box Strap Bolts—
10 in. long by 7-16 at screw end, ₱ set of 8 bolts...55c
12 " ½ " ₱ " 8 " ...70c
12 " ⅝ " ₱ " 8 " $1 00
14 " ⅝ " ₱ " 8 " 1 10
16 " ⅝ " ₱ " 8 " 1 20
5 cts. ₱ set for each additional inch over 14 inch, by ¾. All lengths made.
Wagon Box Rods, narrow track each 18c
Wagon Box Rods, wide track, each 20c
Single Tree Irons, per set of four pieces 38c
Wt. Iron Bolster Plates, 2¼ in. wide, per set 60c
" " 3 " " 65c
" " 3¼ " " 70c
" " 3½ " " 75c
Wagon Brake Ratchets 16¼c each
" " " finished with guard 45c each
Wrought rub irons 11c each
Wrought Hammer Straps, heavy pattern.. 16c each
" " " light pattern.. 13½c each
Stay Chain Hooks 8c each
Single Tree or End Clips each 9c
Double or Center Clips, light each 10c
" " " heavy each 12c
Strap Bolts, Rods, Single Tree Irons, Bolster Plates, Brake Ratchets, Hammer Straps, Rub Irons, Stay Chain Hooks and Clips, in lots of 50 set...15% dis.
Wagon Box Staples, 1½ to 2½ in. to clinch per 1000, $16 50 net
Wagon Box Staples, Box Iron, to rivet on, per 1000, $11 50 net
Neck Yoke Eyes, each 5¾c net
Neck Yoke Eyes, with ⅞ inch rings 8¾c net
King Bolts, ⅞, 1, 1⅛, and 1¼ in. diam. ₱ lb. 6c
Wagon Rivets, ex. large, oval and steeple head, ¾ in. diam., all lengths, ₱ lb 11½c
Wagon Rivet, 3-16 inch diam., all lengths 13½c
Wagon Rivets & nails in 5 lb paper boxes, ₱ lb ex 1c
Wagon and Hinge Nails, ₱ lb net 17½c
Coupling Plates } 10c ₱ lb net
Double Tree Plates }
Tongue Plates }
Neck Yoke Plates ₱ lb 13c
Tongue Cap Iron, 1¾, 2 and 2¼ in. wide, same price ₱ lb as Band Iron.
Wagon Chains, Stay Lock and Tongue 5-16 in., 13½c; ¼ in., 14½c.

Nails, Brads, Spikes, etc.

CUT NAIL LIST.

10d to 60d nails, fence, and brads $5 50
8d and 9d nails, fence and brads 5 75
6d and 7d nails, fence and brads 6 00
4d and 5d nails, fence and brads 6 25
3d nails, fence and brads 7 00
2d nails, fence and brads 8 25

TOBACCO.

FINE BLUED.		BARREL.	
3d	$8 25	1½ inch	$6 25
2d	9 25	1¾ inch	6 50
LINING.		1¼ inch	7 00
7-8	10 00	1⅛ inch	7 25
CASING.		1 inch	8 00
10d to 50d	6 25	⅞ inch	8 50
8d	6 50	FINISHING.	
6d	6 75	10d to 50d	6 75
4d	7 00	8d	7 00
		6d	7 25
		4d	7 50

Cut spikes, all sizes 5 75
Cut boat spikes 6 25
Clinch nails, all sizes 6 25

TERMS.—Sixty day's time, or two per cent. discount if remitted within ten days from date of invoice. Prices subject to changes in market without further notice.

LENGTH OF NAILS.

2d, 1 inch; 3d, 1¼ inch; 4d, 1½ inch; 5d, 1¾ inch; 6d, 2 inch; 7d, 2¼ inch; 8d, 2½ inch; 9d, 2¾ inch; 10d, 3 inch; 12d, 3¼ inch; 16d, 3½ inch; 20d, 4 inch; 30d, 4½ inch; 40d, 5 inch; 50d, 5½ inch; 60d, 6 inch.

BOSTON.

Corrected by Fuller, Dana & Fitz, 110 North St., Boston, Importers and Commission Merchants.

Tin Plates.

I. C. Charcoal per box @ 14 00
" Coke " @ 13 00
" Terne " @ 12 50

Metals.

Pig Tin, Banca, gold per lb. 36c
" Straits, " " 31½c
" English, " " 31½c
Copper, Sheathing " 43c
" " yellow " 33c
Copper Bolt " 45c
" Braziers " 45c
" Ingot " 37c
" Old " "
Lead, Spanish Pig, gold " 6¼c
" Sheet and Pipe " 9·90c
" Old " 6¾c
Spelter, Silesian, gold " 7¼c
" American, " " 6½c
Zinc, Sheet " 10¾c

Iron.

Sheet Iron, Russia, gold per lb. 18c
" English " 7c @ 7½c
" American " 8c
" Galvanized " 11c @ 13c
Swedes Bar Iron, Flat, gold per ton, $135 00 @ $145 00
" Shoe Shapes, " " 150 00 @
Norway Bar Iron, Flats, " " 135 00 @ 145 00
Norway Shapes, gold, per ton, 150 00 @
Norway R'd, 2 in. to ¾ in. gld. pr. ton 140 00 @
" " 11-16 to ¾ in. " " 157 50 @
" " 5-16 to ¼ in. " " 160 00 @
" Nail Rods, Roll'd " " 172 50 @
" " U. B. " " 167 50 @
" " Benzon " " 162 50 @
" " Vasa, " " 157 50 @
" " Wiw, " " 152 50 @
English Refined Bar Iron, " 100 00 @
Scotch Pig Iron, " 52 00 @ 55 00
American " " 50 00 @ 55 00
Wrought Scrap Iron, " 42 00 @ 45 00

Steel.

English Tool Steel, gold per lb. 16c.
" Machinery Steel, gold " 10c.
American Tool " " 16c.
" Machinery " " 11c.
Bessemer Steel 8½ @ 9¾c
German " per lb. 10¾c.
Spring Steel " 9c.
Tire " " 8c.
Sleigh Shoe Steel " 7c.
Toe Calk " " 8¾c.

BUFFALO.

Reported by Messrs. Sidney Shepard & Co.

Jan. 2d, 1873.

Axes, Chopping—Blood's $13 50 @ 14 50
Augers—C. S. cut dis 25%
Bits, Auger—Pierce's 25%
" Jennings' dis 10%
Bells, Cow—Yaw's Genuine net
Bells, Hand dis 50 @ 50&10%
Bellows—Smiths' dis 15 @ 20%
" Moulders' dis 15%
Bolts—Carriage and Tire, dia. neck dis 60 & 10%
Braces, Bit—Barber's dis 30 & 10%
" Spofford's Patent dis 37½%
Brads, Cut dis 50 @ 50&7½%
Boards—Stove, Brooks' Patent, new list dis 30%
Buckets—Well per doz $6 00
Butts—Brass dis 25%
" Cast Loose Joint dis 40%
" " " Pin dis 30%
" " " Japanned dis 30%
" " " Silver Tipped dis 20%
" Wrought Narrow net
" " Broad, Loose Joint dis 15%
" " Table and Back Flaps net
Belting—Rubber dis 30 @ 33½%
" Leather, new list, dis 30 @ 30 & 5%
Beaters, Egg, "Peerless" per doz $4 00
Brick—Bath (box of 2 doz) Best English $1 50
" "Rutherford" $1 25
Bung Borers—"Enterprise" dis 20%
Chalk—White, Carpenter's per gross, 50c
" Blue, Carpenter's " " $1 00
" Crayon School " " 14c
Chisels—Firmer Sockets dis 60 @ 60 & 5%
" Framing Socket dis 60 @ 60 & 5%
" Corner Socket dis 60 @ 60 & 5%
" Slick's Carpenters' dis 60 @ 60 & 5%
Castings—Malleable ₱ lb, 11c
Cutters, Meat—Hale's Patent dis 10%
Cherry Seeders per doz $9 00
Elbows—Corrugated 5 5½ 6 7 } dis 10%
" Russia 10·00 13·00 13·00 14·00 }
Faucets—Wood, Cork Lined dis 50 @ 50&10%
Files—Wheeler, Madden & Clemson's dis 42½%
Freezers, Ice Cream—"Champion" dis 33⅓%
Gates—Molasses—
Patent Self-Measuring ₱ doz. $42 00; dis 20%
Hinges—Window Blind—"Shepard's" dis 30%
" "Standard" dis 30%
" Wrought Strap and T 7½%
Hods, Coal—Plain, Black and Galvanized new list net
" Funnel, Black and Galvanized new list net
" Fancy and Helmet new list net
Hammers—Maydole's net
" Yerkes & Plumb's dis 5%
Hatchets—Blood's net @ 5%
Hooks and Staples—Wrought 50&10 @ 60%
Hooks—Belt dis 45&10%
Hasps and Staples—Wrought dis 50&10%
Sad Irons ₱ lb 5½c
Kettles—Brass ₱ lb, 52½c
" Enameled dis 30%
" Knives, Drawing—Oval No. 1 dis 60 @ 60 & 5
" Razor Blade dis 50%
" Corn, Greenwood's dis 25&5%
Lanterns "Peerless", No. 1 5 10
" ₱ doz $26 00 $12 50 $15 00 dis 10%
" "Radiant" 75 100 150 175
" ₱ doz $13·13 13·13 22·50 22·50 dis 20%
Knobs—Door, R. & E. Mfg Co dis 20 @ 25%
Locks—Door, R. & E. Mfg. Co. dis 20 @ 25%
Machines—Apple Paring, Turn Table, $8 50 ₱ doz
" " " Lightning
Timmen's
Doweling, Merchant's, No. 1 " 4 75
" " No. 2 " 5 00
Mills, Coffee—Box and Slide, common dis 10%
" Box Union and Eagle dis 5%
" Swift's Patent dis 10%
" "Champion" dis 20%
Nails—Cut, Chesapeake $5 25 rates
" Clout and Finishing list 60 dis 7½%
" Shoe list 60 dis 7½%
" Horse, Ausable No. 5 6 7 8 9 10
30 27 25 24 23 22c
" " 1000 lbs dis 5%
" Clinton No. 6 7 8 9 10
23 21 20 19 18c
Packing—Rubber dis 30 @ 33⅓%
Pencils, Slate—Soapstone 4 5 6 in.
20 40 50c. per 100
" Case lots dis 20%
Paint—White Lead, U. S. Gov't ₱ lb 9¼c
Rivets—Iron, Black and Tinned dis 20 @ 25%
" Copper 5 @ 10%
Rope—Manila, ½ inch and larger ₱ lb 18c
Rules—Boxwood and Ivory dis 30&10%
Staples—Blind, Boardman's Pat., ½ & ⅝ ₱ lb 37c
Skates—White's dis 20%
Straps, Skate—Russet and Black net @ 20%
Spoons—Iron Tinned dis 10%
" " " by the case dis 20%
Plated Rogers' A No. 1 dis 25&5%
Squares—Steel and Iron ust net
Shoes, Horse—H. Barden & Sons ₱ keg $7 00
Shovels & Spades—Shepard, Forsyth & Dennison dis 5%
Saws—Henry Disston & Sons dis 5%
Scales—Buffalo Scale Works dis 25%
" Fairbanks dis 15%
Screws—National Screw Co. Iron dis 50%
" " Brass dis 40%
Shears—Seymour's dis 50%
Scythes—Greenwood's dis 25&5%
Tools—Timmen's
Traps, Steel—Newhouse dis 17½%
Tacks—Half Weight Am. Iron dis 70 @ 70&7½%
Vises—Parallel, Buffalo dis 15%
Wrenches—Coes' genuine dis 25%
" Coes' Imitation dis 45 & 10%
" Tafts' Pattern dis 62½&10%
Ware—French, Tinned and Iron dis 20%
" Stamped and Japanned net
" Cast Iron Hollow dis 20@30%

METALS.

Tin Plates, Charcoal IC.

10x14 $13 00
12x12 13 50
12½x17 12 50
14x20 14 00
14x20 terne 12 00
20x28 " 27 00
Add for each X 2 50
Pig Tin—Straits 39 @ 40c
" Banca 46 @ 47c
Solder No. 1 No. 2 (50 lbs. deduct ½c
24c 22c (100 " " 1c
Sheet Zinc, "Lasalle," 1000 500 100 lb casks
$10 75 $10 85 $11 05 ₱ 100 lbs
Iron Wire—Bright and annealed dis 10 @ 20%
" Coppered dis 5 @ 15%
" Tinned dis 5 @ 15%
" Tinned Broom Nos. 20 to 22 ₱ lb 16½
Copper—Sheathing 14@18 oz ₱ lb 43c
" Planished ₱ lb 49 @ 51c
" Bottoms ₱ lb 45c
" Bolts ₱ lb 45c
" Braziers' Sheets ₱ lb 45c
Sheet Iron—W. D. Wood & Co.'s Smooth Char. Jun
Nos. 10 to 14 7·05 8·55 10·05c
Nos. 15 to 20 7·25 8·75 10·25c
Nos. 21 to 24 7·45 8·95 10·45c
Nos. 25 & 26 7·65 9·15 10·65c
No. 27 7·85 9·35 10·85c
Am. Russia A. B.
15c 12c
Gen. Russia, No. 1 stained 19c
" " clean 20c
Galvanized dis 20%

CHICAGO.

Reported by Markley, Alling & Co., Dec. 1872.

AUGERS AND BITS.

Ives', extra C. S. dis 20%
Jenning's net list
Cooks' dis 25%
Snell's dis 7½%
Snell's Car Bits net list

AXES.

Amoskeag Yankee ₱ doz $13 50
" Crescent " 14 00
Hunt's Yankee " 14 50
Kennebeck Yankee " 12 00
Lippincott " " 12 50
" Crown " 13 00
" Beveled " 13 00
Jefford's Silver Steel " 13 00
Red Warrior, Beveled " 14 00
Kennebeck, Handled " 15 00
Boy's, Handled " 12 00

BOLTS.

Carriage and Tire dis 50&20%
Cast Barrel and Shutter dis 20&10%
Wrought Iron Barrel add 10%
" " Square net list

BUTTS.

Cast Fast Joint, Narrow dis 10%
" " " Broad dis 20%
" Loose Joint dis 35%
" " Pin, Reversible dis 25%
" " Japanned dis 25%
" " Silver Tipped dis 25%
Wrought Narrow, Fast Joint net list
" Broad, Fast Joint dis 15%
" " Loose Joint dis 15%
" Loose Pin dis 15%
" Table net list
" Brass dis 15%
Garretson's Blind Butts, Wood doz sets $2 00
" " " Brick doz sets 3 00
Parker's " " Wood doz sets 2 45
" " " Brick doz sets 3 50

CASTERS.

Iron Plate dis 20%
Brass Wheel Plate dis 20%
Porcelain Wheel Plate dis 20%
" " Bed dis 20%
Iron Wheel Bed dis 20%

CHISELS.

Butcher's Tanged Firmer dis 30%
" Long Paring dis 30%
Witherby Socket Framing dis 50&15%
" " Firmer dis 50&15%
" " Corner dis 50&15%
" " Slicks dis 50&15%

COFFEE MILLS.

Box 4 Iron $ 3 75
" 103 " 5 25
" 102 " 7 50
" 107 Britannia 7 50
" 106 " 9 25
" 25 Union 11 00
" 35 " 13 00
" 75 Cast Steel 11 00
" 85 " 13 00
Side 50 4 75
" 60 5 75
" 70 7 25
" 90 18 00
" 15 Union 7 00
" 30 " 8 00

CUTLERY.

American Table dis 20%
" Pocket dis 25%

DOOR SPRINGS.

Torry ₱ doz $7 50
Rubber " 4 00
Boon's " 5 00

DRAWING KNIVES.

Witherby Tool Co dis 50&15%
Ohio Tool Co. net list

FILES.

Butcher's $7 00 £
Nicholson's $5 00 @ $5 50 £

HAMMERS.

Maydole's net list
Yerks & Plumb net list
Cheney net list

HANDLES.

Extra Axe ₱ doz $3 00
No. 1 Axe " 2 25
No. 2 Axe " 2 00
R. R. Pick, No. 1 " 2 00
Coal " " " 2 00
Sledge, No. 1 " 2 00
Hatchet " 65
Hammer, A. E. " 65

HATCHES.

Amoskeag Shingling, No. 1 ₱ doz $7 25
" No. 2 " 8 00
" No. 3 " 8 75
" Claw, No. 1 " 7 75
" " No. 2 " 8 50
" " No. 3 " 9 25
" Lath, No. 1 " 7 50
" " No. 2 " 8 25
" " Solid Steel " 12 00

HINGES.

Strap and T dis 5%
Screw Hook and Strap, 8 to 12 in. net, 10c ₱ lb
" " 14 to 24 in. net, 9c ₱ lb
Hook and Eye Hinges net 12c @ 16c ₱ lb
Gate, No. 35, State ₱ doz $4 5
" No. 3, In and Out " 3 50
" Blinn's Pat " 7 50

HORSE NAILS.

Northwestern, 8d 24c
Ausable, 8d 24

KETTLES.

Brass net 50
Enameled dis 15%

LOCKS AND KNOBS.

Norwalk Lock Co dis 20%
Branford " dis 20%
Eagle " dis 15%
American Pad Locks dis 25%
Continental Lock Co dis 10%

MEAT CUTTERS.

Haven's Patent net list
Hale's " dis 10%
Woodruff " net list
Stowe's Sausage Stuffers net list

MOLASSES GATES.

Stebbin's Patent dis 40%
Enterprise " dis 5%

OIL STONES.

Washita No. 1 net 35c ₱ lb
" Slips net 65c "
Hindostan No. 1 net 9c "
" Axe net 10c "
" Slips net 15c "

PICKS AND MATTOCKS.

Picks, Railroad, Axe Finish ₱ doz, $13 00
" Coal, Axe Finish " 10 00
Mattocks, L. C., Axe Finish " 16 00
" S. C. " 15 50
Grub Hoes, Axe Finish, No. 2 " 12 00

PLANES.

Ohio Tool Co. Bench net list
Sciota dis 10%
A. Howland & Co. Bench net list
" " Fancy net list
Bailey Patent Iron dis 15%
Plane Irons, Butcher's dis 50%

RIVETS.

Iron dis 10 @ 15%
Tinned dis 10 @ 15%
Copper, No. 7 net, ₱ lb, 60c

RULES.

Stanley Rule and Level Co dis 30%
Hubbard & Curtiss Mfg. Co dis 30%

SAD IRONS.

Best A No. 1 ₱ lb, net, 5½c
" Copper Face Star " 6c

SANDPAPER.

Wiggin & Stevens, No. 0 to 1½ ₱ ream, net, $4 50
" " No. 2 to 3 " " 5 00

SASH LOCKS.

Champion ₱ gross, net, $12 00
Hopkins & Dickinson dis. 10%
Judd's Patent dis. 10%
Corbin's Patent dis. 10%
Clark's " dis. 20%

SAWS.

H. Disston & Sons dis. 10%
Champion X Cut ₱ foot, net, 60c
M. A. & Co. X Cut " " 50c

SCREWS.

American Screw Co.—Iron dis 45&5%
" " —Brass dis 25%
" " —Blued Rd. Head dis 25%

SHOVELS AND SPADES.

Ames' Black Shovels ₱ doz, $15 00
" Polished " " 16 00
" Patent " " 18 00
Alling " " 15 00
" " " Molders' " 18 00
Crane's Black " 12 00
" Polished " " 13 00
Smith's " B. S. L. H. Rd. Pt. " 13 50
" " " B. S. D. H. Rd. Pt. " 14 00
Ames' Black Spades " 16 50
" Polished " " 17 50
" Patent " " 18 00
Alling " " 15 50
Crane's Black " 12 50
" Polish'd " " 13 50

SCOOPS.

Alling Steel Polished, No. 2 ₱ doz, $14 00
" " No. 3 " 14 50
" " No. 4 " 15 00
" " No. 5 " 16 00
" " No. 6 " 17 00
" " No. 7 " 18 00
" " No. 8 " 19 00
" " No. 10 " 22 00
Crane's Polished, No. 5 " 14 00
" " No. 6 " 15 00
" " No. 7 " 16 00
" " No. 8 " 17 00
Crane's Black Coal, No. 4 " 18 00
" " No. 5 " 18 50
Preston, Black Scoops No. 1 ₱ doz $12 00
" " " " 2 " 12 50
" " " " 3 " 13 00
" Half Pol. Scoops No. 1 " 13 00
" " " " 2 " 13 50
" " " " 3 " 14 00
Lippincott, Half Pol. No. 2 " 16 00
" " " 3 " 17 00

WRENCHES.

Taft's dis 60%
Coe's Imitation dis 45%
Coe's Genuine dis 25%

WRINGERS.

Novelty Clothes Wringer ₱ doz $72 00
Universal " " 72 00
Mead's " " 75 00

Iron. (Pittsburgh classifications.)

Flat Bars ₱ lb 5·0 @ 5·4
Heavy Bands 5·6 @ 6·2
Light Bands 6·0 @ 7·2
Hoops 6·3 @ 9·5
Rounds & Squares 5·0 @ 8·6
Ovals 5·2 @ 6·6
Half Ovals & Half Rounds 5·9 @ 8·6
Horse Shoe 6·5

SHEETS.

No. 10 to 14 6·6
No. 15 to 20 6·8
No. 21 to 24 7·0
No. 25 to 26 7·2
No. 27 7·4

Nails.

10d to 60d..per keg	$5 62½	8d....per keg..	$7 12½		
8d and 9d	5 87½	10d	6 87½		
6d and 7d	6 12½	12d	6 87½		
4d and 5d	6 37½	2d	8 37½		
3d	7 12½	3d fine	8 37½		
Casing Nails—		Clinch	7 87½		
6d	6 87½	Cut spikes	5 87½		
8d	6 62½	Barrel—			
10d	6 37½	⅞ inch	8 37½		
12d	6 37½	1 inch	7 87½		
16d	6 37½	1¼ inch	7 12½		
Finishing—		1¾ inch	6 87½		
6d	7 62½	1½ inch	6 12½		

HORSE NAILS.

Northwestern, Nos.	5	6	7	8	9	10
Cents ₱ lb	30	27	25	24	23	22
Ausable	30	27	25	24	23	22

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Gartsherrie $ @ 65 00
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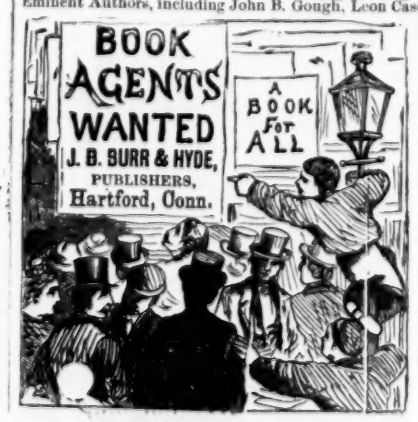

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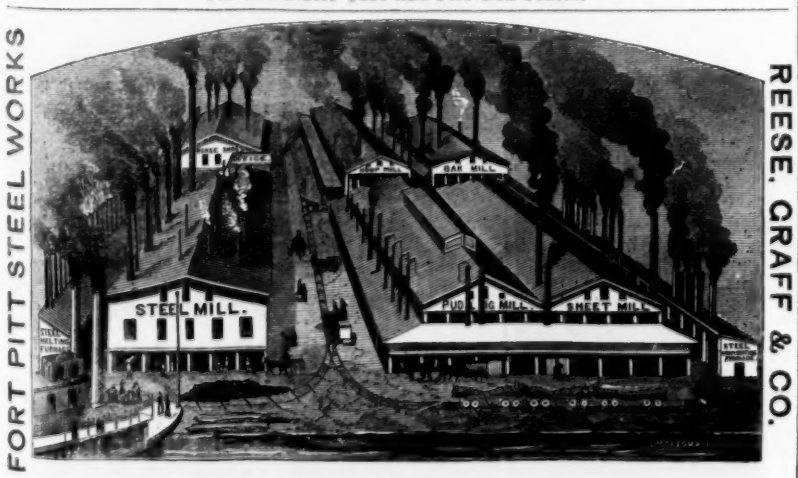

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IX, 10x14 "	17 00
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IC, 12x12, Charcoal	14 50
IX, 12x12, "	17 50
IC, 14x20, Coke	
IC, 14x20, Charcoal	15 00
IX, 14x20, "	18 00
IXX, 14x20, "	21 00
IXXX, 14x20, "	24 00
IXXXX, 14x20 "	27 00
IX, 14x14, "	28 50
DC, 100 Plate, "	14 00
DX "	17 00
DXX, "	20 00
DXXX, "	23 00
IC, 14x20, Coke Roofing	
IC, 14x20, Charcoal Roofing	13 50
IX, 14x20, "	16 00
IC, 20x28, "	29 00
IX, 20x28, "	34 00

PIG TIN.

Large, 60 lb	40c
Small, 30 lb	41c
Bar Tin	42c

ZINC.

In casks 1000 lbs	11½c
" 500 "	11¾c
In sheets	12c
Slab	9c

COPPER.

Copper Bottoms	48c
Sheathing Copper	43c
Planished Copper 14x48	51c
Size, 14x52, 14x56, 14x60 } Nos. 7 8 9 } Plainshed Copper	53c

BRAZIERS' SHEETS, 30x60.

6 to 8 lbs	53c
10 and 12 lbs	50c
15 to 100 lbs	47c
Ingot Copper	
Bolt Copper	52c

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Fine, C. B. & Co.'s Brand	25c
Ordinary	23c
Plumbers' Solder, No. 1	23c
" " 2	21c
ANTIMONY	20c
BABBITT METAL	15c to 25c
GALVANIZED IRON Conductor Pipe, per lb	12c

SHEET IRON.

	Common.	Smooth.	Charcoal.
No. 14 to 24	7¼c	8c	9¾c
25 & 26	7½c	8¼c	9¾c
27	7¾c	8½c	10c

Add ¼c per lb for 30 in. wide.

GALVANIZED IRON.

No. 16 to 20	15c
" 21 to 24	16c
" 25 & 26	17c
" 27	18c
" 28	20c

Discount, 15 per cent.

RUSSIA IRON.

Perfect, all numbers	20c

In sheets, 1c. higher.

AMERICAN RUSSIA.

A	16c
B	14c

In sheets, 1c. higher.

BRAZIERS' RODS.

¼ inch, 10 ft. long, per lb	8c
3-16 " " " "	10c

LEAD.

Pig	9c
Bar	10c
Lead Pipe, in full coils	11c
" " when cut	11½c
Sheet Lead	11c

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Reported by Sellew & Co., Importers and Jobbers of Metals, No. 214, 216 and 218 Main street.

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I. C. 10x14 Charcoal	$14·00 @ 15·00
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I. C. Continuous	27·00

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Pig Tin, Banca, none in stock; Straits, 40 @ 41c; English, 40c; Solder, S. & Co., ℔ lb., 24c; A1, 25c; Roofing, 27c.; Lead, Pig, ℔ lb., 7½ @ 8c; Bar, 8½c. @ 9c.

Copper, Ingot, ℔ lb, Plamished, 54c; Sheathing, 46c; Bolt, 45c; Brazier, 6 to 9 lb, 51c; 10 to 14 lb, 48c; 14 to 100 lb, 45c; Copper Bottoms, 48c.

Zinc, Cask, 500 to 1000 lbs, ℔ lb, 11 @ 11½c; Case, 100 lbs, 12c; Slab, 7¾c @ 8¼c.

Brass, Roll, No. 6 to 30, ℔ lb, 45c; 30 to 38, 50c; 38 to 40, 65c; Wire, No. 0 to 20, 50c; 20 to 25, 60c.

Babbit Metal, Sellew & Co., ℔ lb. 35c; Black Lead, 25c; Market, 15c.

Antimony, ℔ lb, 20c.
Bismuth, ℔ lb, $8·00.
Nickel, ℔ lb, $3·50.

MANUFACTURED IRON.

Bar, per 100 lbs	$5 25 @ 5 75
Sheet, Fo. 24, boiled	7 00 @ 7 50

SHEET IRON.

Russia	℔ lb, 22 @ 23c
Am. Russia A	" 15 @ 16
" " B	" 13 @ 14c

	Com. B.	Smooth Fin. S. L. U.	Smooth D. Re'fd.
18 to 20	6·3c	7·9c	9·3c
22 to 24	6·5c	8·1c	9·5c
26	6·8c	8·6c	9·7c
27	7c	8·8c	9·9c

GALVANIZED IRON.

Nos. 18 to 20	15c
" 22 to 24	16c
" 25 to 26	17c
No. 27	18c
" 28	20c

Galvanized, 15 ℅ discount in full bundles.
Bar Steel, Silver, ℔ lb 22c; Crescent, 17½c.
Iron Wire, discount, 5 @ 10 ℅.
Enameled Ware, discount, 15 @ 25 ℅.

ONE PIECE CORRUGATED ELBOWS.

Charcoal Iron.		Russia Iron.	
4½ inch	℔ doz $3.75	4½ Inch	℔ doz $8.00
5 "	" 4·25	5 "	" 10·00
5½ "	" 5·25	5½ "	" 13·00
6 "	" 5·25	6 "	" 13·00
7 "	" 6·50	7 "	" 14·00

Sheet Iron Bread Pans ℔ lb 12½c.
American Broilers, ℔ doz, $12 @ $15.
Tinmen's Machines, add 5 ℅.
Sad Irons, ℔ lb., 5½c. @ 6c.
Brass Kettles, Ansonia. 53 @ 54c; L. & G., 50c.

Inside Diameter, Inches.	Wrought Iron Pipe, Per Foot.	Weights of Pipe, Per Foot.
⅛	$ 12	24
¼	12	42
⅜	14	56
½	15	85
¾	25	1·12
1	34	1·67
1¼	48	2·25
1½	60	2·69
2	85	3·66
2½	1·25	5·77
3	1·75	7·54
3½	2·10	9·05
4	2·75	0·72

45 ℅ discount.

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Peter Wright's	" " 13½c
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Conqueror	℔ doz $8 50
Lightning	" 8 50
Turn Table	" 8 50

AUGERS AND BITTS.

Cook's	25 ℅ off list
Ives'	20 ℅ "
Jennings'	5 ℅ "
Snell's	10 ℅ "

AXES.

Hunt's	℔ doz $14 00 @ 15 00
Lippincott's	" 13 50 @ 14 50
Lippincott's Pioneer	" 14 00 @ 15 00
Simmons'	" 13 50 @ 14 50

AXLES.

Kritch & Crane Mfg. Co.'s—	
Patent Taper Axles	5 ℅ off list
Swelled Taper Axles	5 ℅ "
Concord Axles	5 ℅ "
Red Jacket Axles	5 ℅ "
Common Axles, 1⅛ inch and upward	℔ lb 9c
" " less than 1⅛ inch	" 9½c

BELLS.

Troy, Church	℔ lb 55c
Light Brass, Hand	50 ℅ off list
Moore's, Cow	20 ℅ "

BOLTS.

Arms, Bell & Co.'s Machine	10 ℅ off 1st
" " " Carriage and Tire	60 ℅ "
Norway Iron Carriage and Tire	45 ℅ "
Cast Iron Barrel, Shutter, &c	30 ℅ "

CAST BUTT HINGES.

Narrow Fast Joint	15 ℅ off list
Broad Fast Joint	30 ℅ "
Broad Loose Joint	40 ℅ "
Reversible	30 ℅ "
Revers. Japanned and Silver Tipped	30 ℅ "
Loose Joint "	20 ℅ "
Excelsior Reversible Blind	25&5 ℅ "
Lull & Porter's Blind	25&5 ℅ "

WROUGHT BUTTS.

Narrow	net list
Reversible	15 ℅ off list
Broad	15 ℅ "
Table Hinges	net list
Back Flaps	net list
Inside Blind Hinges	net list

CASTORS.

Porcelain Wheel Bed or Plate	30 ℅ off list
Iron or Brass " "	20 ℅ "

CHAINS.

English Coil	3-16	¼	5-16	⅜	7-16	½ in.
	15	12½	11¾	11	10½	10c. gold
Trace					6½	10-2 70c. "
					7	10-2 75c. "

German Coil and Halter.....new list add 25 ℅

CHISELS.

Socket, Firmer or Framing	55 ℅ off list

CLOTHES WRINGERS.

Colby's	℔ doz $66 00
Novelty	" 72 00
Universal	" 72 00
Monitor	" 72 00

COFFEE MILLS.

Parker's	net list
P. S. W. & Co.'s	5 ℅ "

CORN KNIVES.

Dunn Edge Tool Co.'s Clipper	℔ doz $5 75
Disston's	" 5 75

CROW BARS.

Steel Pointed	℔ lb 8 @ 10c
Solid Cast Steel	" 20c

CUTLERY.

J. Russell & Co.'s, Lamson, Goodnow & Co.'s, Landers, Frary & Clark's	15 ℅ off new list

FILES AND RASPS.

Nicholson's Mill Files	$5 50 to the £ currency
Nicholson's Other Files	5 00 to the £ currency
Butcher's Files	7 00 to the £ currency
Heller's Horse Rasps	$10 00 to the £ cur'y less 40 ℅

FORKS AND HOES.

Auburn Mfg. Co.'s Hay & Manure Forks	25 ℅ off list
" " " Handled Hoes	20 ℅ "
" " " Planter Eye Hoes	add 15 ℅ to list
Winsted's Planter Eye Hoes	add 15 ℅ "

HAMMERS.

Yerkes & Plumb	new list net
Masons' Hammers	℔ lb 20c
Smith Hand Hammers	" 22c

HANDLES.

	Extra.	No. 1.	No. 2.	No. 3.
Axe	$2·75	$2·25	$1·75	$1·00
Pick	Extra.	No. 1.	No. 1½.	No. 2.
	$2·50	$2·00	$1·75	$1·25

Smith & Montross Fork, Hoe and Rake	10 ℅ off list
" " Broom and Mop	$12 @ $18 ℔ M.

HARROW TEETH.

1 inch iron	℔ lb 6c
¾ and ⅞ inch, iron	" 6½c
½ inch iron	" 6½c
Barbed or Headed	½c extra

HATCHETS.

Hunt's	add 5 ℅ to list
Simmons'	5 ℅ off list

HAY KNIVES.

Lightning	℔ doz, $24 00
Dunn Edge Tool Co.'s	℔ doz $14 50—less 10 ℅
Fisher's	" 16 50—less 10 ℅

HINGES.

Strap and T—St. Louis make	net list

HORSE NAILS.

Eureka	25c rates
Ausable	22c "
Northwestern	22c "
Eagle	19c "

HORSE SHOES.

Rhode Island (Perkin's pattern)	℔ keg $7 50
Burden's	" 7 50
Mule Shoes	$1 00 extra
Rhode Island Trotting Shoes	" 2 50 "

LOCKS AND LATCHES.

Jones & Nimick's	20 ℅ off list.
Moorehead, Adams & Co	20 ℅ "
Norwalk Lock Co.'s revised list	20 ℅ "

MATTOCKS AND GRUB HOES.

Klein, Logan & Co.'s Mat'cks	℔ doz. $14 25 @ 15 75
" Grub Hoes, Oval Eye	℔ doz. $11 00 @ 12 50

NAILS.

Wheeling	$5 60 rates.

PICKS.

Klein, Logan & Co.'s	R. R. and Clay	$12 00 ℔ doz.
" "	Coal	9 75 "
" "	Poll	12 00 "
" "	Stone	16 50 "
" "	Tamping	19 00 "

PLANES.

Ohio Tool Co.'s	add 15 ℅ to list
Eastern	add 10 ℅ "

SAD IRONS.

Monitor Brand, Silver Polished	℔ lb 6c

SASH WEIGHTS.

Standard Solid Eyes	℔ lb 3½c

SAWS.

Disston's	5 ℅ off list
Spear & Jackson's	$5 00 to £ gold
Hubbard, Lippincott, B. & Co.'s	10 ℅ off list
Branch, Crooks & Co.'s	10 ℅ "
Livingston's Patent Buck	net list

SCREWS.

American Screw Co.'s revised list	45 ℅ off
$2000 worth in 6 months	2½ ℅ extra

SCYTHES.

Blood's C. S. & G. S.	net list
Dunn's Edge Tool Co.'s	"
Paris Furnace Co's	20 ℅ off list
Waldron's English	$9 00 to £

SCYTHE STONES.

No. 1 Indian Pond	℔ gross	$ 7 00
Extra Indian Pond	"	7 50
Premium	"	9 50
Diamond Grit	"	13 50

25 ℅ off

SHOVELS, SPADES AND SCOOPS.

Ames'	add $1 00 to list
Lippincott's	new list net
Rowland's	net list

SLEDGES.

Smith Stone or Coal Sledges—	
Steel Face Polished	℔ lb 17c
Solid Cast Steel	" 35c
Striking Sledges	℔ lb extra 1c

SNATHS AND CRADLES

	20 ℅ off list

SPRINGS.

Cleveland Spring Co.'s—	
Carriage and Express	net list
Blue Seat Springs	20 ℅ off list

TACKS.

Norway Tack Co.'s ¼ weight	70 ℅ off list
Brads	50 ℅ "

TRAPS.

Newhouse Patent	12½ ℅ off list
Reichard's Animal, Wood Bottom	℔ doz $10 00
" Metal Bottom	" 12 00

VISES.

Solid Box	℔ lb 18c
Wilson Mfg. Co.'s	15 ℅ off list

WRENCHES.

Coes' Genuine	25 ℅ off list
Coes' Pattern	40 ℅ "
Taft's	50 ℅ "

London Metal Market

From the Mining Journal.

COPPER.

Best selected	per ton	93	0	0	95	0 0
Tough Cake and Tile	"	90	0	0	93	0 0
Sheathing and Sheets	"	91	0	0	95	0 0
Bolts	"	100	0	0		
Bottoms	"	101	0	0		
Old (exchange)	"	75	0	0	78	0 0
Burra Burra	"	90	0	0		
Wire	per lb.				0	1 0¾
Tubes	"	0	1	0	0	1 1

BRASS.

Sheets	per lb.	0	0	9¾	0	0 10¾
Wire	"	0	0	9¾		
Tubes	"	0	0	10¾	0	0 11
Yellow Metal Sheathing	"	0	0	7¾	0	0 8
Sheets	"	0	0	7¾	0	0 8

SPELTER.

Foreign	per ton.	23	10	0	24	
To arrive						

ZINC.

In sheets	per ton.	31		0		

TIN.

English Blocks	per ton.	141	10	0	142	0 0
Ditto Bars	"	142	0	0	143	0 0
Ditto, refined	"	143	0	0	144	0 0
Banca	"	144	0	0	145	0 0
Straits	"	136	0	0	137	0 0

TIN PLATES.*

IC Charcoal, 1st quality†	per box.	1	18	6	2	0 6
IX Ditto, 1st quality	"	2	4	6	2	6 6
IC Ditto, 2d quality	"	1	15	6	1	18 6
IX Ditto, 2d quality	"	2	2	6	2	4 6
IC Coke	"	1	13	0	1	15 0
IX Ditto	"	1	19	0	2	1 0
Canada plates, per ton	"	24	0	0		
Ditto, at works	"	21	0	0	22	0 0

IRON.

Bars, Welsh, in London	per ton.	10	10	0	11	0
Ditto to arrive	"	10	10	0		
Nail rods	"				11	0
" Stafford in London	"	11	2	6	12	10
Bars "	"	11	15	0	12	0
Hoops "	"	13	0	0	14	
Bars " at works	"	12	0	0		
Hoops " "	"	13	0	0		
Sheets, single	"	14	0	0	14	10
Pig, No. 1, in Wales	"	6	0	0	7	0
Refined metal, ditto	"	7	0	0	8	
Bars, common, ditto	"	9	15	0	10	0
Ditto, merchant Tyne or Tees	"				11	0
Do., Railway, in Wales	"	9	15	0	10	0 0
Ditto Swd., in London	"	15	15	0		
Quarrive	"					
Pig, No. 1, in Clyde	"	5	5	0	6	5 0
Do., f.o.b. Tyne or Tees	"	4	10	0	5	10 0
Ditto, Nos. 3, 4, f.o.b. do	"					
Railway chairs	"	5	5	0	6	0 0
" spikes	"	12	10	0	14	0 0
Indian Charcoal Pigs in London	"	7	0	0	8	0 0

STEEL.

Swedish, in kegs (rolled)	per ton.					
Ditto (hammered)	"	18	10	0	19	0 0
Ditto in faggots	"					
English, Spring	"	23	0	0	25	0 0
QUICKSILVER, per bottle		nom.			12	15 0

LEAD.

English Pig, common	per ton.	21	15	0	22	0 0
Ditto, LS	"				21	15 0
Ditto (WB)	"	22	10	0	23	0 0
Ditto, sheet	"				22	15 0
Ditto, red lead	"	24	10	0		
Ditto, white	"	28	10	0	30	0 0
Ditto, patent shot	"	24	10	0	24	15 0
Spanish	"	21	5	0	21	10 0

*At the works, 1s. to 1s. 6d. per box less. †Add 6s for each X.

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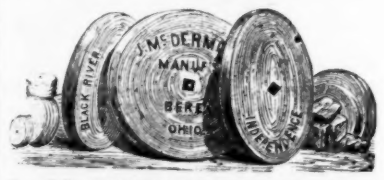

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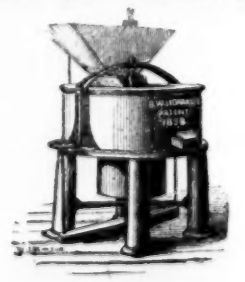

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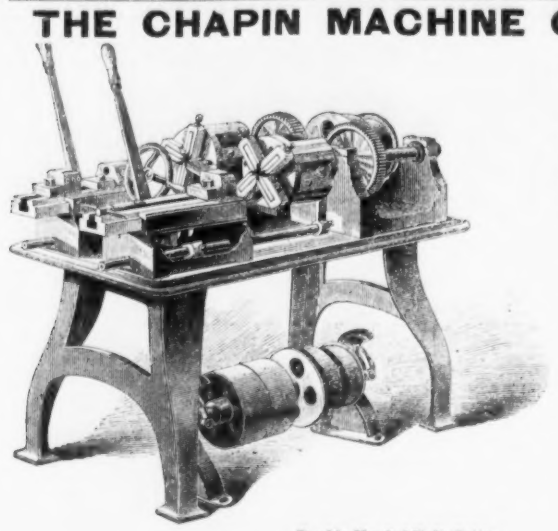

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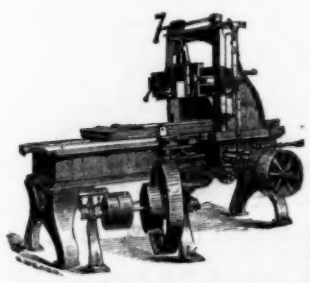

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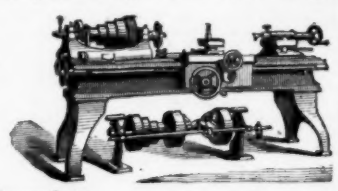

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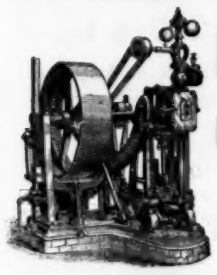

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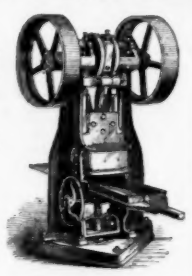

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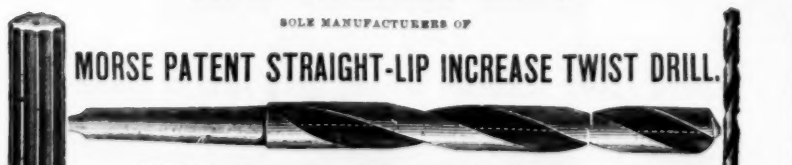

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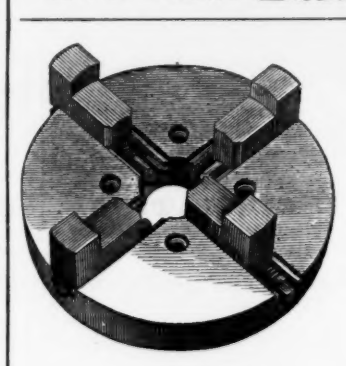

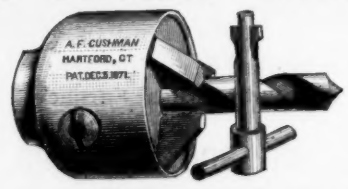

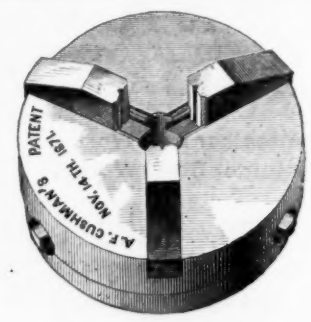

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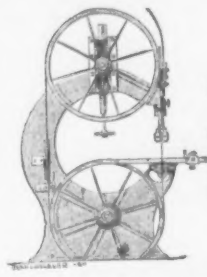

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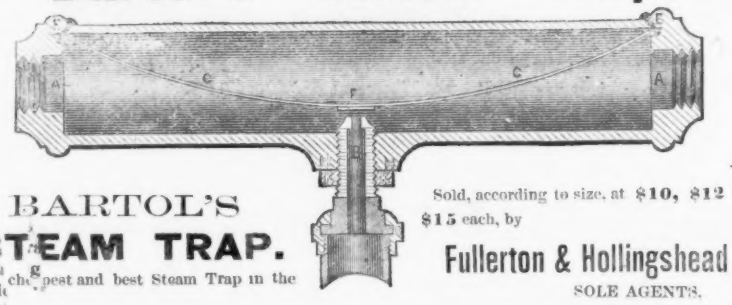

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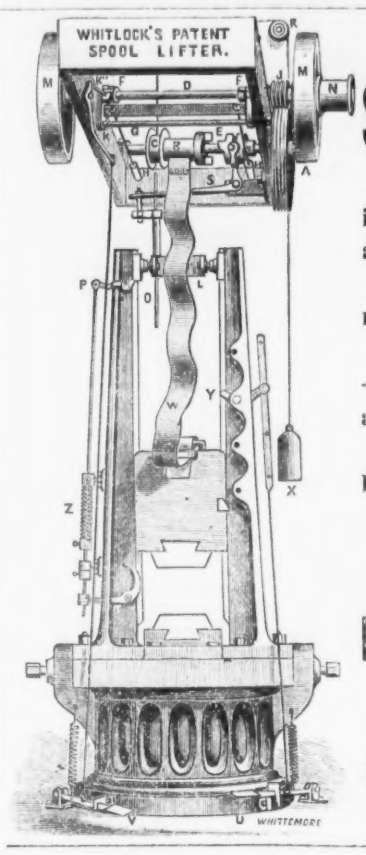

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Will lift any Drop Hammer now in use with less regular power than any other.

Will raise a weight any distance required.

Can be worked as perfectly as any—striking a very light or as heavy a blow as desired.

It catches the hammer on the rebound.

Is not liable to get out of order.

Warranted as represented.

Built by the

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Who also manufacture
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New Union Steam Safety Elevator,

For all places where SAFE and uninterrupted work is a requisite. The Winding Engine is Doubled Cylindered and Reversible-positive motioned—drives the Winding Drum without belt, by gearing alone, which is machine cut on the quick motion, has balanced Valves, Steel Piston Rods with solid heads, metallic ring pistons, boxes of brass and best babbit metal. All steam joints have ground or scraped surfaces, requiring no rubber or other packing. The Reversing Valve-Face is movable, and both valve and seat can be changed within an hour. Two Safety Platforms are driven by it, one ascending while the other descends, which are made large to accommodate the barrows. The "top man" starts the platforms when ready, and they stop automatically at the upper and lower landings. Very compact and simple, yet perfect in arrangements, it is not liable to get out of order, but all the perishable parts are so adjustable, as to be easily and speedily replaced when worn out, and it is *thoroughly reliable.*

One of these is in use at DEWEY, VANCE & CO.'S New Furnace, at Wheeling, W. Virginia.

The Engine and Winding Drum can be had separately, if desired. Send for Circular.

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Hot Blast and Steam Pipes,
Marine, Stationary and Locomotive Boilers, Steam Fire Engines, Pipes, Cylinders, Vacuum Pans, Water Pipes, Super-heaters, Safe Filling, and all HEATED SURFACES.
Warranted to Resist 2,500 Degrees of Heat.
Manufactured by the
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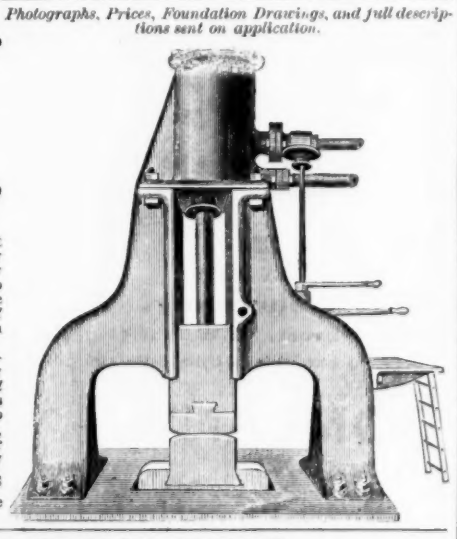
With our latest Improvements.

Photographs, Prices, Foundation Drawings, and full descriptions sent on application.



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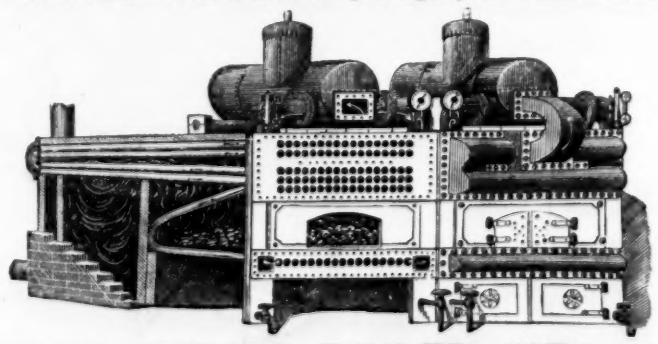
THESE BOILERS
Have stood the most severe tests for the past eight years without an accident.



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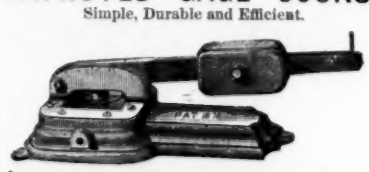

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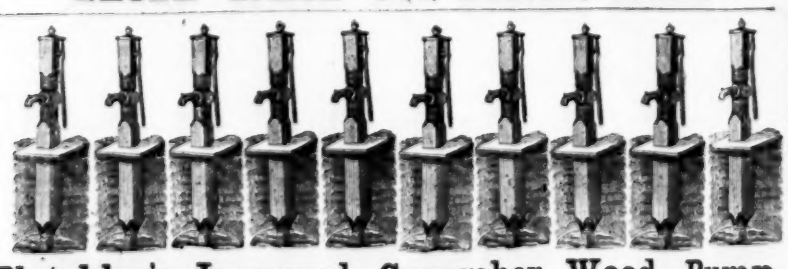

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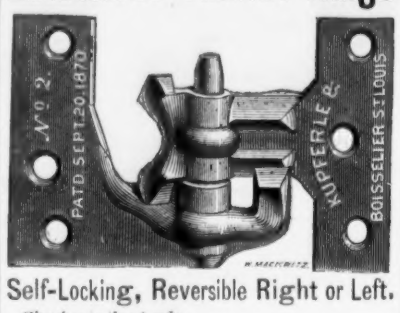

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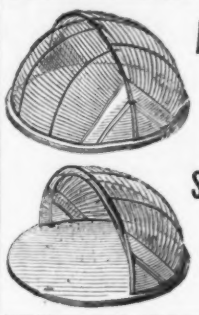

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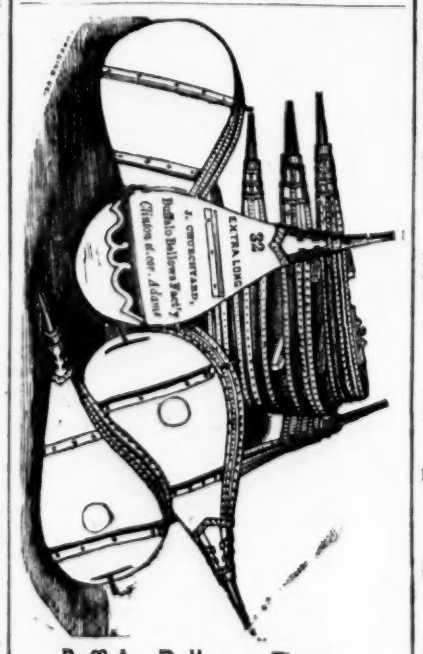

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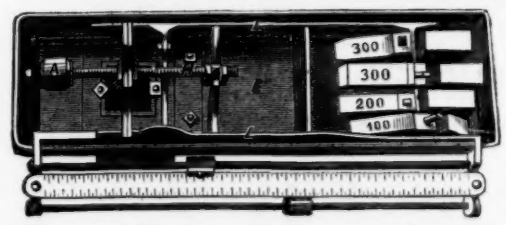
IT IS THE SCALE PERFECTED.



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